**MINE DEVELOPMENT ASSOCIATES**
MINE ENGINEERING SERVICES

Report Date: October 15, 2018
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# TECHNICAL REPORT AND ESTIMATE OF MINERAL RESOURCES FOR THE IRON CREEK COBALT-COPPER PROJECT, LEMHI COUNTY, IDAHO, USA

**Submitted to:**

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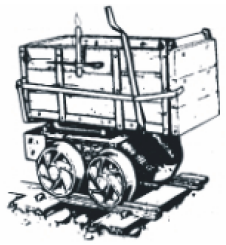

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1.0 SUMMARY (ITEM 1) ..... 1
- 1.1 Property Description and Ownership ..... 1
- 1.2 Exploration and Mining History ..... 1
- 1.3 Geology and Mineralization ..... 2
- 1.4 Metallurgical Testing and Mineral Processing ..... 2
- 1.5 Mineral Resource Estimate ..... 3
- 1.6 Conclusions and Recommendations ..... 4

2.0 INTRODUCTION AND TERMS OF REFERENCE (ITEM 2) ..... 5
- 2.1 Project Scope and Terms of Reference ..... 5
- 2.2 Frequently Used Acronyms, Abbreviations, Definitions, and Units of Measure ..... 6

3.0 RELIANCE ON OTHER EXPERTS (ITEM 3) ..... 8

4.0 PROPERTY DESCRIPTION AND LOCATION (ITEM 4) ..... 9
- 4.1 Location and Land Area ..... 9
- 4.2 Agreements and Encumbrances ..... 11
- 4.3 Environmental Liabilities ..... 12
- 4.4 Environmental Permitting ..... 13

5.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE, AND PHYSIOGRAPHY (ITEM 5) ..... 14
- 5.1 Access to Property ..... 14
- 5.2 Climate ..... 14
- 5.3 Physiography ..... 14
- 5.4 Local Resources and Infrastructure ..... 14

6.0 HISTORY (ITEM 6) ..... 16
- 6.1 Exploration History ..... 16
- 6.2 Historical Mineral Resource Estimates ..... 18



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7.0 GEOLOGIC SETTING AND MINERALIZATION (ITEM 7) ..... 20
7.1 Regional Geologic Setting ..... 20
7.2 Property Geology ..... 23
7.3 Mineralization ..... 25
7.3.1 No Name and Waite Zones ..... 27
7.3.2 Ruby Zone ..... 28
7.3.3 Sulfate Zone ..... 29

8.0 DEPOSIT TYPES (ITEM 8) ..... 30

9.0 EXPLORATION (ITEM9) ..... 31

10.0 DRILLING (ITEM 10) ..... 34
10.1 Summary ..... 34
10.2 Historical Drilling ..... 34
10.3 First Cobalt Drilling 2017 - 2018 ..... 36
10.4 Drill-Hole Collar Surveys ..... 36
10.5 Down-Hole Surveys ..... 36
10.6 Summary Statement ..... 37

11.0 SAMPLE PREPARATION, ANALYSIS, AND SECURITY (ITEM 11) ..... 38
11.1 Historical Sample Preparation, Analysis and Security ..... 38
11.2 First Cobalt Sample Preparation, Analysis and Security ..... 38
11.3 Quality Assurance/Quality Control ..... 39

12.0 DATA VERIFICATION (ITEM 12) ..... 40
12.1 Site Visit ..... 40
12.2 Database ..... 40
12.3 Quality Assurance/Quality Control ..... 40
12.3.1 Standards (CRMs) ..... 41
12.3.2 Duplicate Samples ..... 42
12.3.3 Blanks ..... 46
12.3.4 Discussion of QA/QC Results ..... 47
12.4 MDA Independent Verification of Mineralization ..... 47
12.5 Summary Statement on Data Verification ..... 48

13.0 MINERAL PROCESSING AND METALLURGICAL TESTING (ITEM 13) ..... 49
13.1 Historical Testing ..... 49
13.2 Metallurgical Testing by First Cobalt 2018 (McClelland Laboratories) ..... 49
13.3 Summary ..... 56

14.0 MINERAL RESOURCE ESTIMATES (ITEM 14) ..... 57
14.1 Introduction ..... 57
14.2 Database ..... 60
14.3 Models ..... 61
14.3.1 Cobalt Model ..... 62
14.3.2 Copper Model ..... 65
14.4 Density ..... 70
14.5 Sample and Composite Statistics ..... 71
14.6 Estimation ..... 73
14.7 Mineral Resources ..... 75
14.8 Discussion of Resources ..... 79

15.0 MINERAL RESERVE ESTIMATES (ITEM 15) ..... 82

23.0 ADJACENT PROPERTIES (ITEM 23) ..... 84

24.0 OTHER RELEVANT DATA AND INFORMATION (ITEM 24) ..... 86

25.0 INTERPRETATION AND CONCLUSIONS (ITEM 25) ..... 87

26.0 RECOMMENDATIONS (ITEM 26) ..... 88

27.0 REFERENCES (ITEM 27) ..... 89

28.0 DATE AND SIGNATURE PAGE (ITEM 28) ..... 92

29.0 CERTIFICATE OF QUALIFIED PERSONS (ITEM 29) ..... 93

## TABLES

Table 1.1 Iron Creek Inferred Resources....3
Table 1.2 Recommended Iron Creek Work Program....4
Table 4.1 Annual Land Holding Costs for the Iron Creek Property....11
Table 6.1 Historical Estimates of "Reserves" in the No Name Zone....19
Table 10.1 Iron Creek Drilling Summary....34
Table 12.1 Cobalt and Copper Assays from MDA Verification Samples 2018....48
Table 13.1 Adit Bulk Sample Head Assays....50
Table 13.2 Summary of 2018 Rougher Flotation Tests....51
Table 13.3 Cleaner Test Results for Bulk Sample 4313-001....52
Table 13.4 Cleaner Test Results for Bulk Sample 4313-002....53
Table 13.5 Cleaner Test Results for Bulk Sample 4313-003....54
Table 14.1 Descriptive Statistics - Resource Drill-Hole Database....61
Table 14.2 Descriptive Statistics by Cobalt Domain....63
Table 14.3 Descriptive Statistics by Copper Domain....66
Table 14.4 Density Values Applied to the Iron Creek Block Model....71
Table 14.5 Capping Levels for Cobalt by Domain....71
Table 14.6 Capping Levels for Copper by Domain....71
Table 14.7 Descriptive Composite Statistics by Cobalt Domain....72
Table 14.8 Descriptive Composite Statistics by Copper Domain....73
Table 14.9 Estimation Parameters....74
Table 14.10 Iron Creek Inferred Resources....76
Table 23.1 eCobalt Solutions Reported Resources....85
Table 26.1 Cost Estimate for the Recommended Program....88

## FIGURES

Figure 4.1 Location of the Iron Creek Cobalt – Copper Project ..... 9
Figure 4.2 Iron Creek Property Map ..... 10
Figure 7.1 Regional Geologic Setting of the Iron Creek Project ..... 21
Figure 7.2 General Project Area Geologic Map ..... 22
Figure 7.3 Property Geologic Map ..... 24
Figure 7.4 Simplified Regional Geology of the Idaho Cobalt Belt ..... 25
Figure 9.1 Cobalt in Pyrite by Grain Size ..... 33
Figure 10.1 Map of Drill Holes in the Iron Creek Property ..... 35
Figure 12.1 Cobalt Standard OREAS 76a Results ..... 41
Figure 12.2 Cobalt in Duplicate Core Samples: Relative Difference ..... 43
Figure 12.3 Cobalt in Duplicate Core Samples: Absolute Value of Relative Difference ..... 43
Figure 12.4 Copper in Duplicate Core Samples: Relative Difference ..... 44
Figure 12.5 Copper in Duplicate Core Samples: Absolute Value of Relative Difference ..... 44
Figure 12.6 Cobalt Assays in Duplicate Pulp Samples ..... 45
Figure 12.7 Copper Assays in Duplicate Pulp Samples ..... 45
Figure 12.8 Cobalt in Blanks and Preceding Samples ..... 46
Figure 12.9 Copper in Blanks and Preceding Samples ..... 47
Figure 13.1 Grind Size Optimization Plot for 2018 Bulk Samples ..... 51
Figure 14.1 Cumulative Probability Plot of Cobalt Assays ..... 62
Figure 14.2 Iron Creek Cobalt Domains– Section 2600 ..... 64
Figure 14.3 Cumulative Probability Plot of Copper Assays ..... 65
Figure 14.4 Iron Creek Copper Domains– Section 2600 ..... 67
Figure 14.5 Perspective View of Iron Creek Cobalt and Copper Grade Shells ..... 68
Figure 14.6 Iron Creek Cobalt and Copper Domains– Section 2600 ..... 69
Figure 14.7 Scatterplot of Analyzed S% to Measured Density ..... 70
Figure 14.8 Iron Creek Cobalt Domains, Geology and Block Model– Section 2600 ..... 77
Figure 14.9 Iron Creek Copper Domains, Geology and Block Model– Section 2600 ..... 78
Figure 14.10 Confining Surfaces and Volumes and Additional Mineralization ..... 80
Figure 14.11 Grade Shells at 0.20%CoEq and 0.35%CoEq ..... 81
Figure 23.1 Exploration Activity in the Idaho Cobalt Belt ..... 84

## APPENDICES

Appendix A: List of Iron Creek Unpatented Claims

## 1.0 SUMMARY (ITEM 1)

Mine Development Associates ("MDA") has prepared this Technical Report on the Iron Creek cobalt and copper project, located in Lemhi County, Idaho, at the request of First Cobalt Corp. ("First Cobalt"), a Canadian company based in Toronto, Ontario, that is listed on the TSX Venture exchange (TSX-V: FCC), the Australian Stock Exchange (ASX: FCC) and is also traded over the counter (OTCQB: FTSSF). The purpose of this report is to provide a technical summary of the Iron Creek cobalt-copper project and public disclosure of the first formal estimate of mineral resources for the project prepared by MDA.

This report and the resource estimates have been prepared in compliance with the disclosure and reporting requirements set forth in the Canadian Securities Administrators' National Instrument 43-101 ("NI 43-101"), Companion Policy 43-101CP, and Form 43-101F1, as well as with the Canadian Institute of Mining, Metallurgy and Petroleum's "CIM Definition Standards - For Mineral Resources and Reserves, Definitions and Guidelines" ("CIM Standards") adopted by the CIM Council on May 10, 2014. The authors are qualified persons under NI 43-101 and have no affiliations with First Cobalt or the property, except that of independent consultant-client relationships. The effective date of this report is September 18, 2018.

### 1.1 Property Description and Ownership

The Iron Creek property consists of seven patented Federal lode claims and a surrounding group of 83 unpatented Federal lode claims (Figure 4.2) located about 18 miles southwest of Salmon, Idaho, within the historic Blackbird cobalt-copper mining district. Together the patented and unpatented claims cover an area of 1,698 acres. As of the date of this report, First Cobalt owns a 100% interest in the 83 unpatented claims, a 100% interest in the mineral rights of the seven patented claims, and 100% of the surface rights to all but one of the seven patented claims, all with no underlying royalties or lease payments. The total annual land-holding costs are estimated to be $12,998.

### 1.2 Exploration and Mining History

The first mining claims were staked in the Iron Creek area in 1967 on copper-stained material in what later became known as the "No Name" zone. In 1970, these claims were leased to Sachem Prospects Corporation ("Sachem") of Salt Lake City, Utah. Sachem drilled 11 diamond-core holes and drove three underground exploratory drifts known as the East Adit, West Adit and a short unnamed adit. Hanna Mining optioned the property in 1972 through its wholly owned subsidiaries, Coastal Mining Co. and Idaho Mining Co., and acquired it outright in 1973.

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From 1979 through 1996 the property was explored by Noranda Exploration, Inc., Inspiration Mines, Inc., Centurion Gold, and Cominco American Resources Inc. Various campaigns of drilling, geophysical surveys, and surface and underground geochemical sampling were conducted. A total of 57 holes were drilled between 1969 or 1970 and 1996.

Between 1996 and 2016 the patented and unpatented claims were acquired by the Chester Mining Company ("Chester"). Scientific Metals Corp. ("STM") acquired the Iron Creek property from Chester in 2016 and changed its name to U.S. Cobalt in 2017. U.S. Cobalt conducted exploration drilling in 2017 and 2018 prior to being acquired by First Cobalt.

## 1.3 Geology and Mineralization

The Iron Creek property is situated in the Blackbird copper-cobalt ± gold district, in the eastern part of the Salmon River Mountains. The project area is underlain mainly by mid-Proterozoic metasedimentary siltite and quartzite of the Apple Creek Formation, which is part of the Belt Supergroup. Bedding and foliation generally strike northwest and dip 60° to 80° northeast. Ash-flow tuff of the Eocene Challis Volcanic Group unconformably caps the Apple Creek units that host the cobalt and copper mineralization within the property.

Four zones of stratiform cobalt and copper mineralization have been identified in and adjacent to the property within sequences of dominantly argillite and siltite between units of quartzite of the Apple Creek Formation. These are the No Name and Waite (formerly the Footwall No Name) zones in which the estimated resources are located, and the Sulfate and Ruby zones, which are exploration targets.

The principal mineral assemblage consists of pyrite, chalcopyrite, pyrrhotite, and magnetite with much lesser quantities of native copper and arsenopyrite locally. Scanning-electron and microprobe tests indicate the cobalt occurs largely or entirely within pyrite and there is a distinct lack of cobaltite. Drill results demonstrate that the cobalt and copper mineralization are in part separated from each other spatially, and in part overlapping.

## 1.4 Metallurgical Testing and Mineral Processing

Preliminary flotation tests have been completed by First Cobalt using two bulk samples extracted from Adit-1 and one bulk sample from Adit-2, all from within the No Name Zone. Two samples had copper grades close to 1.0% and all three had cobalt grades in the range of 0.25 to 0.040%. All three samples responded very well when subjected to rougher flotation using standard conditions at the natural pH of 6 to 8. Copper recovery into the bulk concentrate averaged over 97% for the two high-grade samples and 92.5% for the low-grade sample. Cobalt recovery averaged 96% for the three samples.

Cleaner flotation tests performed on the sulfide rougher concentrates showed optimum performance was achieved by regrinding the rougher concentrate and floating at pH 12 to depress the pyrite. For the two high-grade copper samples, 75% to 85% of the copper was recovered into copper concentrates that would be suitable for conventional copper smelting. The unrecovered copper was split between losses in the pyrite product and a middling stream that would be recycled back to the rougher circuit in an

actual operation. The low-grade copper sample appears to need some further flotation optimization in order to produce acceptable smelter feed.

The cobalt was recovered in the pyrite product that represents the cleaner flotation tailings. For all three samples this product contained more than 90% of the cobalt in the pyrite at grades of 1.2% to 1.8% Co. Higher grades may be difficult to obtain, as the cobalt appears to be bound up within the pyrite crystal structure. The unrecovered cobalt was split between the copper concentrate and the middling stream.

No testwork has yet been done on recovery of the cobalt from the pyrite concentrates. However, two approaches appear to be technically viable. One is to roast the concentrate, then leach the cobalt from the resulting cinder and concentrate the cobalt using solvent extraction. Final recovery of the cobalt would be as a salt or electrowon metal. The other approach is to use an autoclave to oxidize the pyrite and solubilize the cobalt, then use solvent extraction.

## 1.5 Mineral Resource Estimate

The database contains 10,740 assay records, all of which were deemed usable in modeling metal domains and density, but only those from 62 core holes drilled by First Cobalt were used to estimate cobalt and copper resources at Iron Creek. Historical drilling was excluded due to lack of original source data and sometimes conflicting locations. Inverse distance estimation was used to calculate block-diluted Inferred resources of 29.6 million tons at average grades of 0.08% cobalt and 0.30% copper (Table 1.1). These are reported at a cutoff of 0.03%CoEq for potentially open-pit minable material and 0.18%CoEq cutoff for potentially underground minable material.

**Table 1.1 Iron Creek Inferred Resources**

| Cutoff | Tons | Grade | Grade | Pounds | Grade | Pounds |
|---|---|---|---|---|---|---|
| %CoEq | | %CoEq | %Co | Cobalt | %Cu | Copper |
| **0.03/0.18*** | **29,630,000** | **0.11** | **0.08** | **45,352,000** | **0.30** | **175,448,000** |
| 0.18 | 4,858,000 | 0.30 | 0.23 | 22,250,000 | 0.69 | 66,749,000 |
| 0.20 | 4,100,000 | 0.32 | 0.25 | 20,172,000 | 0.71 | 58,384,000 |
| 0.35 | 1,144,000 | 0.47 | 0.39 | 8,923,000 | 0.84 | 19,219,000 |

*Note: * All classified resource blocks located a) between the topographic surface and the surface defining material most likely minable by open pit and with grades greater than 0.03% CoEq were included in the reported mineral resources and b) resource blocks located below the surface defining material most likely minable by open pit and with grades greater than 0.18% CoEq were included in the reported underground mineral resources.".*

The tabulations at 0.18%CoEq, 0.20%CoEq and 0.35%CoEq represents material that would be available if only an underground scenario is to be considered.

A little over half of the resources lie within the No Name zone; the remainder is in the Waite zone footwall to the No Name zone. More drilling internally will upgrade these resources. Importantly, the deposit is open along strike in both directions and at depth so this estimate is only a snap-shot in time with expectations that it will increase in size.

## 1.6 Conclusions and Recommendations

The exploration conducted by First Cobalt has produced information on which important interpretations, conclusions and decisions can be made. All historical information on the other hand cannot be used for more than an indication of mineralization.

First Cobalt's drilling has encountered stratiform cobalt zones with highly variable thickness but up to 70ft thick and copper zones, also with highly variable thickness and up to 100ft thick. That drilling has extended the cobalt and copper mineralization for 2,300ft along strike and 1,800ft vertically. Cobalt and copper occupy separate mineralized domains that are in part overlapping, and both metals commonly occur in economic grades separate from each other.

Thicker zones can be correlated with the present drill spacing only with moderate confidence. Infill drilling will be required for upgrading the Inferred resources to Indicated or Measured classifications because there is nothing definitive yet known about any of the zones to confidently make correlations. The thicker zones can, however, be correlated with confidence. The resource estimate presented in this report should be considered only a snap shot in time of what ultimately should become larger resources.

The authors believe that the Iron Creek project is a project of merit. The property deserves substantial additional drilling along strike, at depth, and as infill drilling. Exploration drilling outside the main resource area is also justified. The recommended work program of $8.55 million, as shown in the budget in Table 1.2, includes a total of around 70,000ft of core drilling. Some of the drilling will be done from underground in Adit-3 so the cost estimate includes $1.1million for rehabilitation and development work in the adit. The total drill budget comes to $7 million when assaying and sampling, geology, managing, road/pad construction, and maintenance of the underground workings are included. Metallurgical test work should continue and those results should be incorporated in updated resource estimates and preliminary economic evaluations.

**Table 1.2 Recommended Iron Creek Work Program**

| Item | Estimated Cost ($) |
|---|---|
| Underground Development | $ 2,280,000 |
| Drilling, Core (approx. 70,000ft) | $ 3,536,000 |
| Assays and Sampling | $ 875,000 |
| Geology | $ 1,365,000 |
| Reporting | $ 150,000 |
| Metallurgy | $ 150,000 |
| Geophysics | $ 70,000 |
| Tools & Supplies | $ 52,000 |
| Permitting & Legal | $ 51,000 |
| Travel | $ 21,000 |
| ***Total*** | ***$ 8,550,000*** |

## 2.0 INTRODUCTION AND TERMS OF REFERENCE (ITEM 2)

Mine Development Associates ("MDA") has prepared this Technical Report on the Iron Creek cobalt and copper project, located in Lemhi County, Idaho, at the request of First Cobalt Corp. ("First Cobalt"), a Canadian company based in Toronto, Ontario, that is listed on the TSX Venture exchange (TSX-V: FCC), the Australian Stock Exchange (ASX: FCC) and is also traded over the counter (OTCQB: FTSSF). First Cobalt has acquired 100% of U.S. Cobalt Inc. ("U.S. Cobalt"), the previous owner of the Iron Creek project. U.S. Cobalt was formerly known as Scientific Metals Corp. ("STM"), and was listed on the TSX Venture exchange (TSX-V: USCO).

The purpose of this report is to provide a technical summary of the Iron Creek cobalt-copper project and public disclosure of the first formal estimate of mineral resources for the project prepared by MDA. The mineral resources were estimated and classified under the supervision of Steven J. Ristorcelli, Principal Geologist for MDA, and include the results of drilling conducted through August 27, 2018. Mr. Ristorcelli is a qualified person under the Canadian Securities Administrators' National Instrument 43-101 ("NI 43-101") and has no affiliations with U.S. Cobalt, First Cobalt or the property, except that of independent consultant-client relationship. Section 13 of this report was prepared under the supervision of Mr. Joseph Schlitt, MMSA-QP of McClelland Laboratories, Inc. Mr. Schlitt is a qualified person under NI 43-101 and has no affiliations with U.S. Cobalt, First Cobalt or the property, except that of independent consultant-client relationship. Portions of this report were modified from a Technical Report prepared for STM by Cullen (2016) that did not include estimated mineral resources.

This report has been prepared in accordance with the disclosure and reporting requirements set forth in the NI 43-101, Companion Policy 43-101CP, and Form 43-101F1. The mineral resources reported herein have been estimated and classified in accordance with the Canadian Institute of Mining, Metallurgy and Petroleum's "CIM Definition Standards - For Mineral Resources and Reserves, Definitions and Guidelines" ("CIM Standards") adopted by the CIM Council on May 10, 2014.

The effective date of this report is September 18, 2018. The effective date of the mineral resource estimate is September 14, 2018.

### 2.1 Project Scope and Terms of Reference

The scope of this study included a review of pertinent technical reports and data provided to MDA by First Cobalt relative to the general setting, geology, project history, exploration activities and results, methodology, quality assurance, interpretations, drilling programs, and metallurgy. The authors have relied fully on the data and information provided by First Cobalt for the completion of this report, including the supporting data for the estimation of the mineral resources.

Mr. Ristorcelli visited the Iron Creek project June 18$^{th}$ and 19$^{th}$, 2018. This site visit included reviewing sampling and exploration procedures, visiting inspecting surface outcrops and underground workings, reviewing core and taking independent samples. Mr. Schlitt has not visited the project.

The author has relied almost entirely on data and information derived from work done by First Cobalt and its predecessor operators of the Iron Creek project. Mr. Ristorcelli has reviewed much of the

available data, made a site visit, and has made judgments about the general reliability of the underlying data. Where deemed either inadequate or unreliable, the data were either eliminated from use, or procedures were modified to account for lack of confidence in that specific information. The authors have made such independent investigations as deemed necessary in their professional judgment to be able to reasonably present the conclusions discussed herein.

## 2.2 Frequently Used Acronyms, Abbreviations, Definitions, and Units of Measure

In this report, measurements are generally reported in Imperial units. Where information was originally reported in metric units, MDA has made the conversions as shown below.

Currency, units of measure, and conversion factors used in this report include:

| | | |
|---|---|---|
| **Linear Measure** | | |
| 1 centimeter | = 0.3937 inch | |
| 1 meter | = 3.2808 feet | = 1.0936 yard |
| 1 kilometer | = 0.6214 mile | |
| **Area Measure** | | |
| 1 hectare | = 2.471 acres | = 0.0039 square mile |
| **Capacity Measure (liquid)** | | |
| 1 liter | = 0.2642 US gallons | |
| **Weight** | | |
| 1 tonne | = 1.1023 short tons | = 2,205 pounds |
| 1 kilogram | = 2.205 pounds | |

**Currency** Unless otherwise indicated, all references to dollars ($) in this report refer to currency of the United States.

**Frequently used acronyms and abbreviations**

| | |
|---|---|
| AA | atomic absorption spectrometry |
| Ag | silver |
| Au | gold |
| b.y.o | billion years ago |
| cm | centimeters |
| core | diamond core-drilling method |
| $^{o}$C | degrees centigrade |
| °F | degrees Fahrenheit |
| ft | foot or feet |
| g/t | grams per tonne |
| ha | hectares |
| ICP | inductively coupled plasma analytical method |
| in | inch or inches |
| kg | kilograms |
| km | kilometers |

| | |
|---|---|
| l | liter |
| lbs | pounds |
| µm | micron |
| m | meters |
| Ma | million annum |
| mi | mile or miles |
| mm | millimeters |
| m.y.o. | million years ago |
| NSR | net smelter return |
| oz | ounce |
| ppm | parts per million |
| ppb | parts per billion |
| QA/QC | quality assurance and quality control |
| RC | reverse-circulation drilling method |
| RQD | rock-quality designation |
| t | metric tonne or tonnes |
| ton | Imperial short ton (2,000lb) |

## 3.0 RELIANCE ON OTHER EXPERTS (ITEM 3)

The authors are not experts in legal matters, such as the assessment of the legal validity of mining claims, private lands, mineral rights, and property agreements in the United States. The authors did not conduct any investigations of the environmental or permitting issues associated with the Iron Creek project, and the authors are not experts with respect to these issues.

The authors have relied fully on First Cobalt to provide full information concerning the legal status of First Cobalt and related companies, as well as current legal title, material terms of all agreements, and material environmental and permitting information that pertain to the Iron Creek project.

Section 4 in its entirety is based on information provided by First Cobalt, including a title opinion report on the patented and unpatented claims by Stoel Rives LLP dated November 8, 2017. Although Mr. Ristorcelli is responsible for Section 4, Mr. Ristorcelli offers no professional opinions regarding the provided information.

## 4.0 PROPERTY DESCRIPTION AND LOCATION (ITEM 4)

This Section 4.0 is based on information provided to MDA by First Cobalt. Mr. Ristorcelli presents this information in the interest of full disclosure to fulfill reporting requirements of NI 43-101, but expresses no opinion regarding the legal or environmental status of the Iron Creek project. Mr. Ristorcelli is not aware of any other significant factors and risks that may affect access, title, or the right or ability to perform work on the property beyond those summarized below.

### 4.1 Location and Land Area

The Iron Creek project is located about 18 miles southwest of Salmon, Idaho, within the historic Blackbird cobalt-copper district of the Idaho cobalt belt (Figure 4.1). The property consists of seven patented Federal lode claims that straddle Iron Creek, and a surrounding group of 83 unpatented Federal lode claims (Figure 4.2). Together the patented and unpatented claims cover an area of 1,698 acres. The center of the property is located at approximately 44° 57′ 42″ North, and 114° 06′ 57″ West.

**Figure 4.1 Location of the Iron Creek Cobalt – Copper Project**

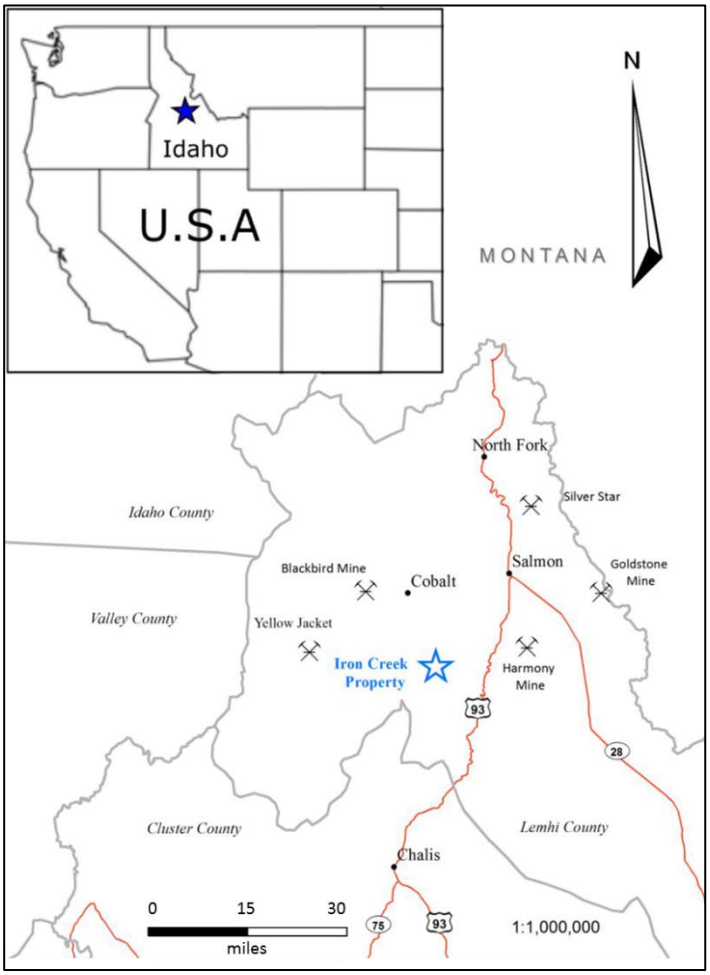
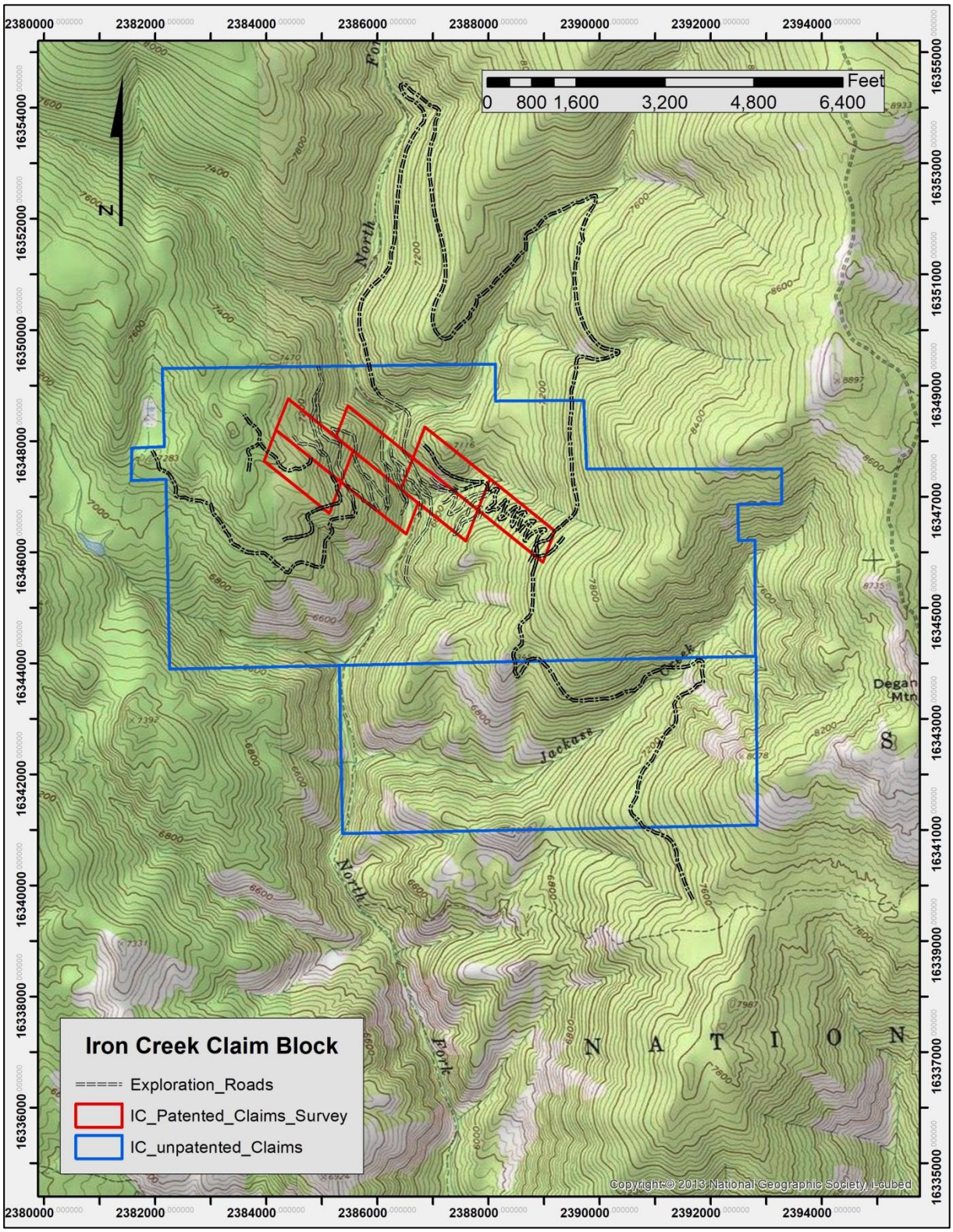


**Figure 4.2 Iron Creek Property Map**
(from First Cobalt, October 15, 2018)



The unpatented claims are held 100% in good standing by the Idaho Cobalt Co. ("Idaho Cobalt"), of Boise, Idaho, a wholly owned subsidiary of First Cobalt. The seven patented claims were acquired from the Chester Mining Company (OTC: CHMN) ("Chester") in 2018. The patented claims are described as: Iron #118, Iron #135, Iron #136, Iron #143, Iron #144 Iron #182, and Iron #189, of the Idaho Mineral Survey No. 3613, located in portions of Section 20 and Section 21, Township 19 North, Range 20 East, B.M., Parcel #RP9900000109A, Blackbird Mining District, Lemhi County, Idaho. Idaho Cobalt holds 100% of the patented claims, except for the surface rights to Iron #144 which are presently being acquired (see Section 4.2). The unpatented claims are listed in Appendix A.

The unpatented claims are on Federal public lands administered by the United States Forest Service ("USFS"). Ownership of the unpatented mining claims is in the name of the holder (locator), subject to the paramount title of the United States of America, under the administration of the USFS. Under the Mining Law of 1872, which governs the location of unpatented mining claims on federal lands, the locator has the right to explore, develop, and mine minerals on unpatented mining claims without payments of production royalties to the U.S. government, subject to the surface management regulation of the USFS. Currently, annual claim-maintenance fees are the only Federal payments related to unpatented mining claims, and these fees have been paid in full to September 1, 2019. The unpatented claims have no expiration date as long as the annual claim-maintenance fees are paid by August 31 of each year. For the patented claims, which are real property, annual property taxes are paid to Lemhi County, Idaho. The current annual holding costs for the Iron Creek project unpatented mining claims are estimated at $12,881 including the county recording fees.

Other annual land holding costs, including county taxes for the patented claims, are listed in Table 4.1. The total annual land-holding costs are estimated to be $12,998.

**Table 4.1 Annual Land Holding Costs for the Iron Creek Property**

| Item | Cost (US$) |
|---|---|
| Unpatented Claim Fees | $ 12,865 |
| County Recording Fees | $ 16 |
| Patented Claim Taxes | $ 117 |
| ***Total Annual Cost*** | ***$ 12,998*** |

The corners of the mining claims have been surveyed professionally, most recently in 2018 by Wade Surveying of Salmon, Idaho. An RTK Total Station survey instrument was used.

## 4.2 Agreements and Encumbrances

STM (later known as U.S. Cobalt, and now First Cobalt) entered into a Mining Lease Agreement with Chester dated August 23rd, 2016, with an option to purchase a 100% interest in the seven patented claims. Under the terms of the lease agreement, STM was required to pay Chester the sum of US$45,000 upon signing of the lease agreement and Chester retained a 4.0% net smelter return ("NSR") royalty. The terms of the agreement also required STM to make advance royalty payments on the NSR of US$3,000 per month for the first two years of the lease agreement, increasing to US$4,000 per month for the subsequent two years, and US$5,000 per month for subsequent years. At any time during the

term of the lease, STM held the right to purchase a 100% interest in the seven claims and reduce the NSR held by Chester from 4.0% to 1.0%, all for consideration of a cash payment US$1,500,000. The NSR may subsequently be purchased for a cash payment of US$500,000 for every 1.0% of the NSR elected to be acquired by STM (now First Cobalt).

On September 4, 2018 First Cobalt announced an agreement had been reached to eliminate the advance royalty payments, purchase the patented claims, and eliminate the 4.0% NSR royalty for $1.07 million, which has been paid in full. As of the date of this report, First Cobalt owns a 100% interest in the seven patented claims and the 83 unpatented claims, excepting the Cherokee Development Corp. interest discussed in the next paragraph.

The surface rights to patented claim Iron #144 are currently owned by Cherokee Development Corp ("Cherokee"). First Cobalt is in the final steps of purchasing these surface rights from Cherokee for US$80,000 with plans to execute the agreement to purchase immediately upon receipt of the purchase documents. With the completion of this transaction, First Cobalt will own a 100%% interest in the seven patented claims and the 83 unpatented claims.

## 4.3 Environmental Liabilities

Mr. Ristorcelli is not aware of any existing environmental liabilities within the property. Because the property is located within the Salmon National Forest, First Cobalt is in communication with United State Forest Service ("USFS") personnel for guidance in ensuring that work is done in compliance with all existing environmental regulations. It is understood that water and particulates from any drilling or other work should be prevented from entering any body of water, such as Iron Creek, without first being treated so that there is no sediment or other contaminants entering the water.

The North Fork of Iron Creek, a perennial regional drainage discharging to the Salmon River, bisects the property, and cuts the sulfide-mineralized stratigraphic section. Adit-1 (East Adit) is excavated approximately 40ft above the elevation of the creek on the east side, and the lay-down and parking area is partially built on waste rock from driving the small adit. The waste rock contains a small amount of pyrite and chalcopyrite and is potentially an isolated point-source of acid mine drainage if it were to become oxidized and enter the creek. This material has a solid covering of clay, soil and rip-rap rock down to the creek level, and there is no evidence of erosion of the pile by the creek during the 40+ years since the original excavation.

First Cobalt has collected baseline water samples from Iron Creek at nine established points upstream, within, and downstream of the property beginning in June 2017, prior to rehabilitating Adit-1 and Adit-2, and before commencing the surface drill program. This sampling is ongoing, and has had no samples with acidic values, and rare isolated samples with base-metal values above detection limits. This sampling program has demonstrated that First Cobalt's exploration activities have had no deleterious effects on the water quality of Iron Creek, and that there is not any acidic material entering the creek from the project area.

## 4.4 Environmental Permitting

The two zones of cobalt-copper mineralization that comprise the No Name and the Waite zones are entirely contained within private ground on patented claims, including projected strike and dip extensions of the zones and indications of mineralization along additional stratigraphic horizons. No environmental permits are needed from any governmental agencies for the current and planned exploration disturbances within the patented claims, including drilling to delineate and extend these two zones.

Surface and underground activities must conform to applicable Mine Safety and Health Administration ("MSHA") standards and regulations. Drilling and underground mapping and sampling are performed in accordance with these regulations. The project is subject to quarterly compliance inspections by MSHA.

A snow removal permit is required by the USFS if plowing is needed to access the project. First Cobalt received this permit during the winter of 2017-2018 in a timely manner, and it is expected that a permit for the 2018-2019 winter will be readily granted.

A separate exploration program is planned for the Ruby zone within the unpatented claims. This will require a permit from the USFS. The planned exploration work will create less than five acres of total new disturbance on USFS ground within the contiguous block of unpatented claims, and therefore requires the Notice of Intent ("NOI") level of permitting. The NOI application has not yet been submitted. Issuance of the NOI will require First Cobalt to post a reclamation bond with the USFS. The USFS District Ranger has 15 days from receipt of the completed application to approve the permit or notify First Cobalt of any required changes in the plan or additional levels of permitting.

The majority of the new access roads required to drill at the Ruby zone will be built on the patented claims and not count against the five-acre NOI disturbance limit. Drill pads will be constructed well outside of the active drainage area, and drilling will be conducted with small track-mounted core rigs to minimize disturbance and avoid travel in ecologically sensitive areas. First Cobalt is not aware of any cultural or environmental factors which would hinder issuance of the NOI permit.

# 5.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE, AND PHYSIOGRAPHY (ITEM 5)

## 5.1 Access to Property

Access to the property is via the paved, all-weather U.S. Highway 93 ("US 93"), and County Road 45 ("Iron Creek Road") located 23mi south of the town of Salmon, Idaho. The Iron Creek Road is a well-maintained gravel road that traverses the central part of the claim group approximately 11mi west of US 93. Access throughout the claim group is good because of a network of logging roads and previously constructed drill roads.

Salmon is a town of about 3,000 inhabitants, with the main industries being tourism, ranching and agriculture, and some logging and mining. There are a number of small mining contractors in the region, with easy access via paved highways to larger urban centers such as Butte, Montana, about 150mi away, and Pocatello and Boise, Idaho, located 210 and 250mi away, respectively.

## 5.2 Climate

The climate can be described as a temperate, continental-montane type. Annual precipitation ranges from 24in per year in the lower elevations, to 30in per year in the upper elevations. Of this, 70% falls as snow. Average winter snowpack is three to four feet in depth. Mining and exploration can be conducted year-round, assuming snow removal is conducted to maintain road access during the winter. Road access for exploration may be limited or interrupted by snow during December through April.

## 5.3 Physiography

The project area consists of hilly to mountainous terrain with broadly rounded ridges surrounded by deeply incised stream valleys, the principal valley being that of Iron Creek and its tributaries. Elevations within the project area range from 6,600ft along Iron Creek to over 8,300ft near the north end of the claim group. Much of the property is forested, with abundant Douglas fir at the lower elevations and lodgepole pine increasing in abundance at higher elevations. Underbrush includes Ninebark brush on the north-facing slopes and pine grass on the south-facing slopes.

## 5.4 Local Resources and Infrastructure

The patented claims are real property with complete surface rights for exploration and mining held by the owner, subject to state and federal environmental regulations. For the unpatented claims, the Mining Law of 1872 provides surface rights to the claim holder, subject to State and Federal environmental regulations. The project area is mountainous and rugged with few localities for permanent structures. Potential ore would likely be transported to an undefined off-site processing plant.

As of the date of this report, electrical power at the project is supplied by diesel-powered generators. The nearest electrical power line is located approximately 11mi from the project. Water for exploration drilling and dust control is available from the Little No Name Creek, a tributary of Iron Creek. Water

for potential mining and mineral processing operations has not been identified and no water rights in the project area are held by First Cobalt.

Fuel, groceries, hotels, restaurants, communications, schools, automotive parts and service, a clinic, and emergency services are available in Salmon, within an hour's drive from the property. Highly-trained mining and industrial personnel are available in Butte, Montana, and Boise and Pocatello, Idaho. Engineering, banking and construction services, as well as heavy equipment sales and maintenance are also available in these cities, as well as in Salt Lake City, Utah, approximately 370 miles from the project.

## 6.0 HISTORY (ITEM 6)

The information summarized in this section is derived from multiple sources, as cited. Mr. Ristorcelli has reviewed this information and believes this summary accurately represents the history of the Iron Creek property.

### 6.1 Exploration History

Much of the following has been modified from Cullen (2016) and references cited therein. According to Park (1973), the area of the Iron Creek property initially drew interest as an iron prospect in 1946. In 1967, during construction of a logging road, a Mr. L. Abbey staked 14 claims on copper-stained material in what later became known as the "No Name" zone (Figure 4.2). In May of 1970, these claims were leased to Sachem Prospects Corporation ("Sachem"), a division of the POM Corporation of Salt Lake City, Utah.

Sachem carried out claim staking, geologic mapping, aerial photography, and induced polarization, self-potential, magnetic and geochemical surveys of the No Name zone. In addition, they drilled 11 diamond-core holes and drove three underground exploratory drifts known as the East Adit, West Adit and a short unnamed adit.

Hanna Mining ("Hanna") optioned the property in 1972 through its wholly owned subsidiaries, Coastal Mining Co. ("Coastal") and Idaho Mining Co. ("Idaho Mining"), and acquired it outright though a legal action in 1973. During 1972 through 1974, Hanna conducted a preliminary evaluation of the No Name zone for copper and cobalt, and reconnaissance exploration of the "Ruby", "Footwall No Name", and "Sulfate" zones (Figure 7.3), as well as areas outside the current property controlled by First Cobalt.

Coastal's work for Hanna included construction of topographic base maps, a soil-geochemical survey for cobalt and copper, a reconnaissance induced-polarization and resistivity survey, a stream sediment survey, an aeromagnetic survey, geologic mapping, diamond-core drilling, underground development and metallurgical testing. A total of 3,000 soil samples were collected at depths of less than 12in, with spacing between samples of 100ft over the No Name zone and every 400ft away from the zone (Park, 1973, cited by Ristorcelli, 1988). The soil samples contained as much as 105 ppm Co and 1,900 ppm Cu (Ristorcelli, 1988).

Coastal drilled a total of 13,250ft of core, principally in the No Name zone, and one hole was drilled in each of the Sulfate and Ruby zones. The 6500 Level adit was driven from Iron Creek, bringing the total drift footage to about 1,500ft. Bench-scale metallurgical tests were done on drill core and samples from the underground drifts. Hanna subsequently calculated "reserves" for the No Name zone (see Section 6.2).

In 1979, Noranda Exploration, Inc. ("Noranda") optioned the nearby Blackbird mine from Hanna; this option included a 75% interest in the Iron Creek property. Noranda conducted geologic mapping, re-logged three of the Coastal drill holes, conducted a soil-sample orientation survey, sampled the overlying Challis volcanic rocks, and mapped the underground workings. Noranda also drilled two core holes within the current property.

Noranda geologists described the stratiform nature of the cobalt and copper mineralized lenses, more than one of which were recognized, and calculated tons and grade for the No Name zone (Webster and Stump, 1980; see Section 6.2, below). Webster and Stump (1980) stated that in some locations the copper mineralization was "*generally overlying cobalt mineralization*".

Noranda subleased the Iron Creek property to Inspiration Mines, Inc ("Inspiration") in 1985. Inspiration's activities are poorly documented and MDA has no information on their exploration work. Later in 1985, Noranda and Inspiration terminated their interest in the property, following which Hanna rehabilitated the underground workings and drove a new portal into the 6500 Level adit, because the original portal had collapsed.

In January 1988, Centurion Gold ("Centurion") acquired the property from Hanna. Centurion drilled three short holes in the Ruby zone in 1989, and completed silt and heavy mineral surveys throughout the property with the objective of finding gold mineralization. Additional geologic mapping was done at this time.

Cominco American Resources Inc. ("Cominco") leased the property from Centurion in 1991. Cominco's goal was to significantly upgrade and enlarge the mineralized material in the No Name zone. During 1991, Cominco compiled and reviewed existing data in an attempt to identify targets to be drilled in 1992. Based on this review, Cominco carried out the following exploration in 1991 and possibly into early 1992:

- Re-analyzed 111 stream-silt samples collected by Centurion;
- Carried out 1:4,800-scale geologic mapping;
- Had a grid of about 16.6 line-miles cut and surveyed by Wilson Exploration;
- Commissioned an EM survey of 15.2 line-miles by Blackhawk Geosciences using the newly surveyed grid;
- Commissioned VLF and ground magnetic surveys of 1.6. line-miles each by Gradient Geophysics;
- Collected 514 soil and 231 rock-chip samples;
- Re-logged approximately 14,600ft of drill core; and
- Created 1:600-scale cross sections through the No Name and Ruby zones; and

MDA has no information on the types of equipment, spacing between stations, or operating parameters used for the geophysical and geochemical surveys done by Cominco during the early 1990s. A decision was reached by Cominco to terminate their lease of the property in early 1992 (Hall, 1992). However, a report by Tureck (1996) indicates that Cominco drilled two core holes that totaled 2,308ft in 1996.

First Cobalt has provided no information on exploration work, if any, done between 1992 and 1996, or when Cominco returned the property to Centurion, which later changed its name to Siskon Gold. MDA has been provided no information on the ownership or work done on the property from 1996 to 2016. At a presently unknown time during that period, the patented and unpatented claims were acquired by

Chester from an unknown owner. Mr. Ristorcelli has no information on the ownership of the claims during this period.

STM acquired the Iron Creek Property from Chester Mining Company in 2016 and changed its name to U.S. Cobalt in 2017. U.S. Cobalt conducted surface exploration drilling in 2017, and underground drilling from the 6500 Level Adit (Adit-2) during the winter of 2017 and into 2018. The 2017 drilling results drew the interest of First Cobalt. In March, 2018, First Cobalt entered into a definitive agreement with U.S. Cobalt to acquire all of the issued and outstanding shares of U.S. Cobalt and the Iron Creek property. Completion of the acquisition was announced by First Cobalt on September 4, 2018.

First Cobalt continued the surface- and underground-drilling campaign to expand the deposit along strike. Drilling was suspended in August, 2018 due to the threat of an advancing wildfire within the Salmon-Challis National Forest, which required the evacuation of the Iron Creek project personnel.

## 6.2 Historical Mineral Resource Estimates

Several historical estimates of "reserves" have been made for mineralized zones in the No Name zone as summarized in Table 6.1. These historical estimates are considered relevant for historical interest with respect to the exploration history at Iron Creek, and they are superseded by the current mineral resource estimates summarized in Section 14.0 of this report. The classification terminology is presented as described in the original references, but it is not known if they conform to the meanings ascribed to the measured, indicated, and inferred mineral resource classifications, or proven and probable reserve classifications, by the CIM Definition Standards. Mr. Ristorcelli has not done sufficient work to classify these historical estimates as current mineral resources or mineral reserves, and First Cobalt is not treating these historical estimates as current mineral resources or mineral reserves. Accordingly, these estimates should not be relied upon. The current mineral resources for the Iron Creek project are discussed in Section 14.0 of this report.

Five sets of "reserves" were calculated by Hanna in 1974 for underground and open-pit mining (Table 6.1) based on 24 core holes spaced at an average distance of about 200ft apart and using a tonnage factor of 11ft$^3$/ton (Markland, 1974). In 1980, Noranda estimated a "tentative reserve" of 1.279 million tons at an average grade of 0.59% cobalt, and later estimated a "high cobalt" portion at 1.0 million tons with an average grade of 0.61%Co and 0.3%Cu (Webster and Stump, 1980; Snow, 1983). It is not known if cutoff grades were applied to any of the historical estimates, other than those of Markland (1972) and Centurion (Ristorcelli, 1988). These estimates were done using then-current but still-appropriate polygonal sectional techniques. The wide range of results does not indicate errors or improper procedures, but rather differences in projection distances of mineralized material, different cutoff grades, different assumptions as well as the early stages of development drilling and exploration. Consequently, these results could have been used for preliminary indications of the size and grade of mineralization, as they were by U.S. Cobalt, but are not considered resources as defined today. All of these historical estimates are superseded by the mineral resources estimated in Section 14.0 of this report.

**Table 6.1 Historical Estimates of "Reserves" in the No Name Zone**

| Year | Company | Tons (000s) | CutOff % | Grade Co % | Grade Cu % | Grade CuEq % | Type, Source of Estimate |
|---|---|---|---|---|---|---|---|
| 1972 | Hanna | 32,100 | 0.4% Cu Equiv | 0.06 | 0.5 | | Open Pit; Markland (1972); based on IP |
| 1973 | Hanna | 2,100 | | 0.17 | 0.82 | | Underground; Akins (1973) |
| | | 20,000 | | 0.088 | 0.606 | | Open Pit; Akins (1973) |
| 1974 | Hanna | 250 | | 0.3 | 1.24 | | Underground East; Markland (1974) |
| | | 4,570 | | 0.03 | 1.84 | | Underground West; Markland (1974) |
| | | 2,400 | | 0.24 | 0.47 | | Open Pit East; Markland (1974) |
| | | 410 | | 0.11 | 2.55 | | Open Pit West; Markland (1974) |
| | | 32,100 | | 0.06 | 0.52 | | Low Grade Open Pit; Markland (1974) |
| 1980 | Noranda | 1,279 | | 0.59 | | | Webster and Stump (1980) |
| 1983 | Noranda | 1,000 | | 0.61 | 0.3 | | Snow (1983); high cobalt portion |
| 1988 | Centurion | 10,000 | 1% Cu Equiv | | | 2.0 | reviewed by Ristorcelli (1988) |

1 *The above estimates are relevant only for historical context, should not be relied on, and are not being treated as current mineral resources by U.S. Cobalt.*

2 *The key assumptions, paramters and methods used to prepare the above estimates are not known.*

3 *The historical estimates above use categories other than those of the CIM Definitions stipulated in NI 43-101, but it is not known how they differ.*

4 *The authors have not done sufficient work to classify the above estimates as current mineral resources or reserves.*

5 *The historical estimates above are superceded by the current mineral resources summarized in Section 14 of this report.*

There has been no historical commercial production of cobalt or copper from the Iron Creek project.

# 7.0 GEOLOGIC SETTING AND MINERALIZATION (ITEM 7)

The information presented in this section of the report is derived from multiple sources, as cited. Mr. Ristorcelli has reviewed this information and believes this summary accurately represents the geology and mineralization of the Iron Creek property as presently understood.

## 7.1 Regional Geologic Setting

The Iron Creek property is situated in the Blackbird copper-cobalt ± gold district, in the eastern part of the Salmon River Mountains. In the mid-1970s, host rocks for the Iron Creek mineralization were assigned to the mid-Proterozoic Yellowjacket Formation by Ruppel (1975). The Yellowjacket Formation, which is part of the Belt Supergroup, can be divided into three distinctive metasedimentary sequences according to Hughes (1983). The Lower Unit is predominantly gray-green phyllite, siltite and minor quartzite, all of which may represent turbidite deposits and have an aggregate thickness of 10,000ft. The Middle Unit, which contains the bulk of the cobalt, copper and gold deposits in the district, consists of 4,000ft of dark-gray and black argillite, siltite, phyllite and fine-grained quartzite. Bedding and foliation are prominent and both generally strike northwest and dip 60° to 80° northeast. The Upper Unit is a distinctive, thickly bedded quartzite with a thickness of 3,000ft.

Geologic mapping in the Salmon River Mountains and the adjacent Lemhi Range during the late 1970s through the mid-1990s resulted in significant revisions to the Yellowjacket Formation in the region and restriction of the formation to the sequence originally defined by Ross (1934) in the vicinity of the Yellowjacket mine, about 15mi northwest of the Iron Creek project (Tysdal, 2000). As shown in Figure 7.1, the Iron Creek project is in an area underlain mainly by rocks of the Apple Creek Formation (unit Yac; "Coarse siltite unit"), which is stratigraphically above the Yellowjacket Formation, and another, stratigraphically higher, unamed unit (Ym) formerly known as the "middle subunit of the Yellowjacket Formation" as used by Connor and Evans (1986). These two Proterozoic units are shown in Figure 7.2 as the "coarse siltite" and "banded siltite" units, respectively.

The Proterozoic rocks in the Iron Creek portion of the Blackbird district are cut by northwest-southeast-trending thrust faults and subparallel folds that have been displaced by younger, north-south and northeast-southwest striking, extensional normal faults (Figure 7.1). In the area of the Iron Creek property, the Yellowjacket Formation is unconformably overlain by units of rhyolitic ash-flow tuff and intermediate to mafic lavas of Eocene age that were erupted from the Challis volcanic field (Evans and Green, 2003). Collectively, these are assigned to the Challis Volcanic Group (Figure 7.1 and Figure 7.2). The Eocene volcanic rocks are younger than the cobalt and copper ± gold mineralization in the district and comprise post-mineral cover.

**Figure 7.1 Regional Geologic Setting of the Iron Creek Project**
(from Tysdal, 2000)

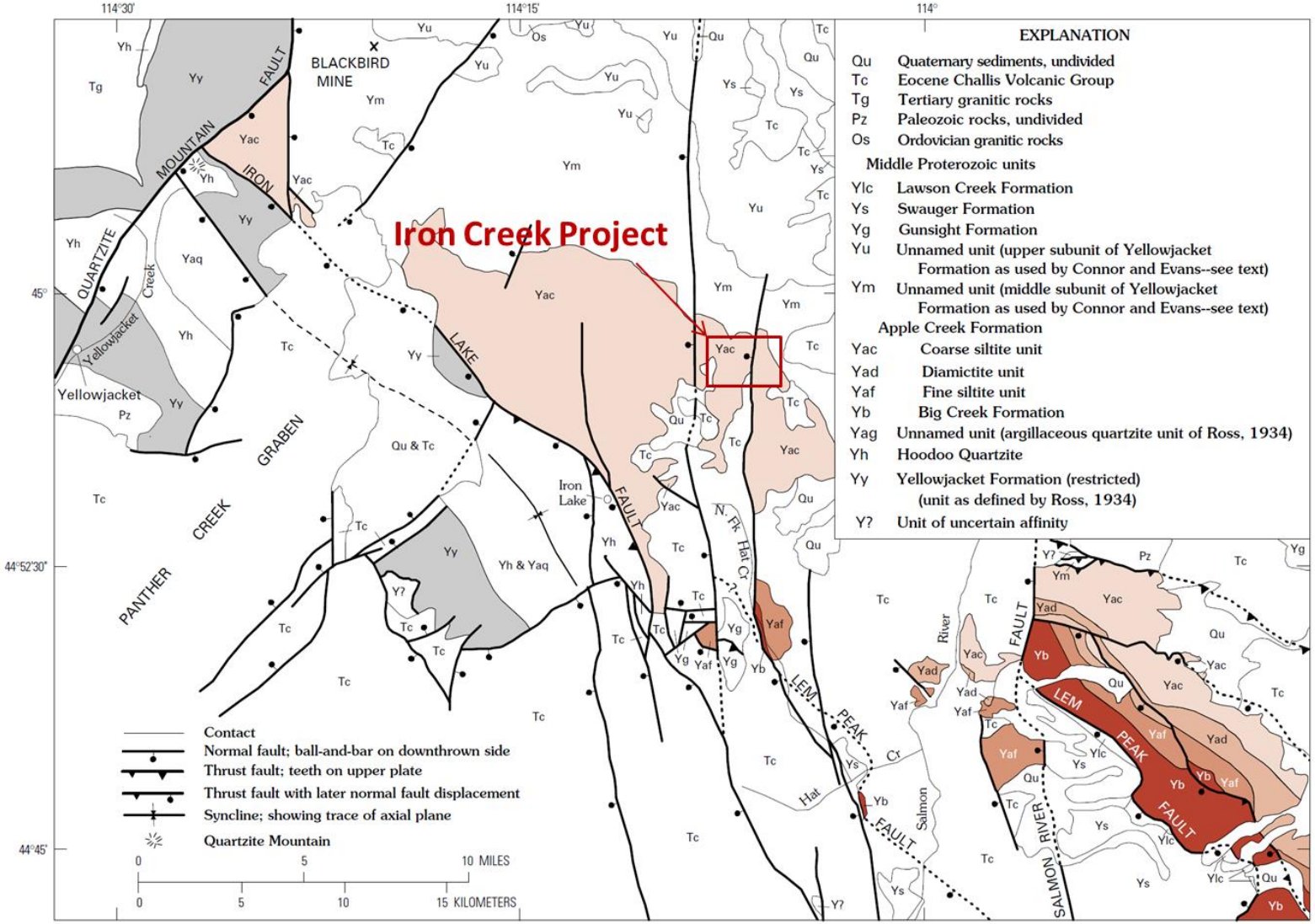
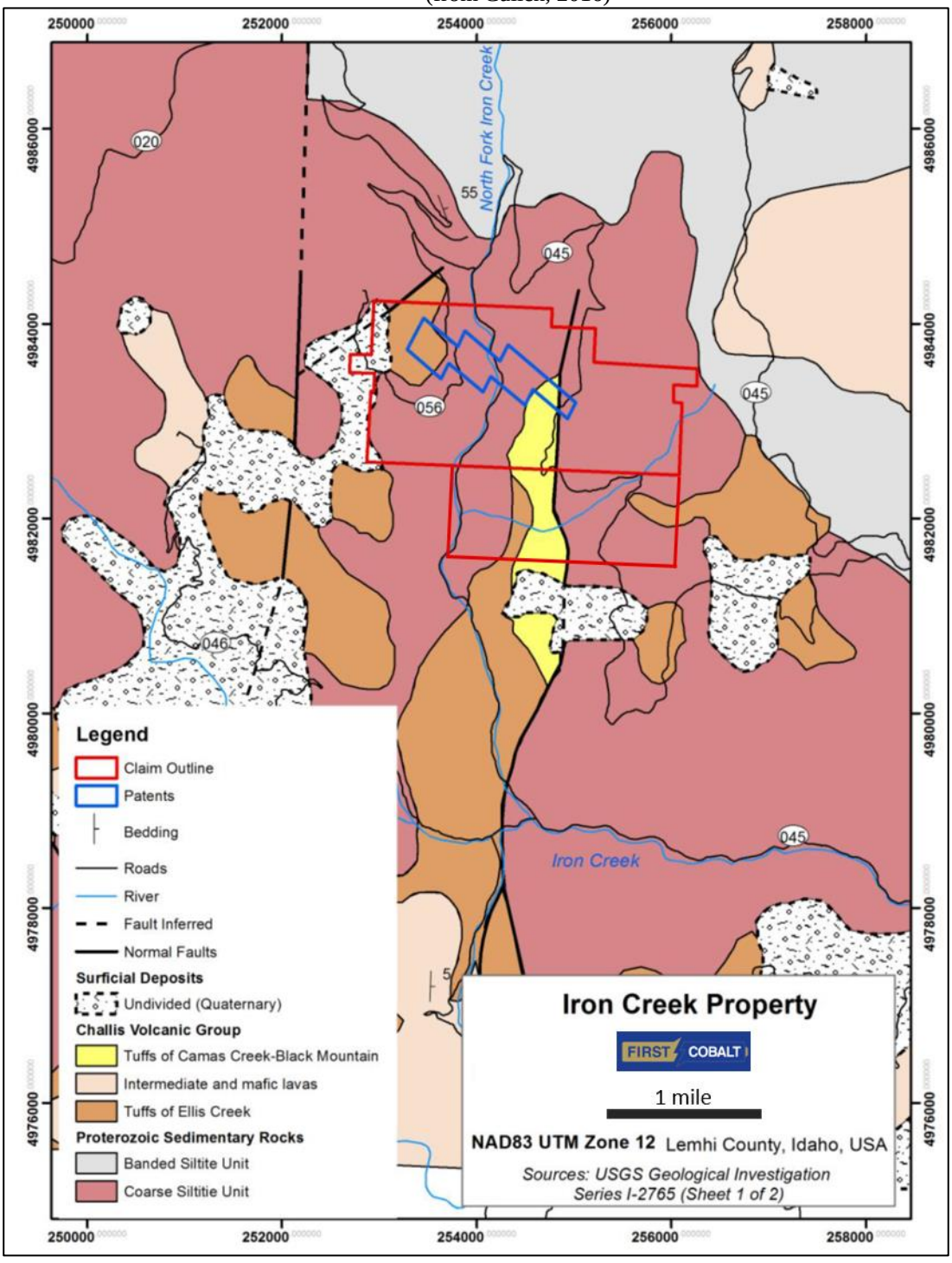


**Figure 7.2 General Project Area Geologic Map**
(from Cullen, 2016)




Historical geologic investigations have concluded in some cases that no severe penetrative deformation has affected the rocks in the Blackbird district and the Iron Creek area, although they have undergone

periods of metamorphism. Nash and Hahn (1986) and Riesmeyer (1986) cited examples of primary sedimentary structures in the project area rocks, particularly near mineralized horizons. Others, such as Hall (1992), concluded that host-rocks now assigned to the Apple Creek Formation in the project area have undergone two phases of Proterozoic deformation and a later phase of deformation during the Cenozoic.

According to Lund (2013):

> *"The region surrounding the Blackbird district was affected by three within-plate igneous events about 30, 700, and 900 m.y. after sedimentation (Evans and Green, 2003; Lund and Tysdal, 2007). Mesoproterozoic (about 1.4 Ga) strata of the Lemhi basin were intruded at 1.37 Ga by granite-granodiorite plutons (Evans and Zartman, 1990). Several generations of xenotime dated between 1.37 and 1.1 Ga (Aleinikoff and others, 2012) indicate that local hydrothermal fluid flow occurred during the Mesoproterozoic, including an event coeval with 1.37-Ga igneous rocks that is regarded by Slack (2012) as the time of Co-Cu-Au mineralization. In the Neoproterozoic-early Paleozoic, the Blackbird region was on the margin of a continental rift that produced several cycles of co-magmatic syenite-diorite intrusions (685-650 Ma and 500-485 Ma; Lund and others, 2010a). Country rocks in the central part of the district were intruded by undated mafic dikes that, based on proximity to several Cambrian plutons, are most likely part of the early Paleozoic extensional intrusive event and interpreted as pre-ore (Lund and others, 2011). Additionally, I- and S-type granites of the Cretaceous Idaho batholith lie less than 15 km west and north of the district and Eocene granites cut rocks within the district, but hydrothermal activities related to these are not thought to be related to the deposits (Lund and others, 2011)."*

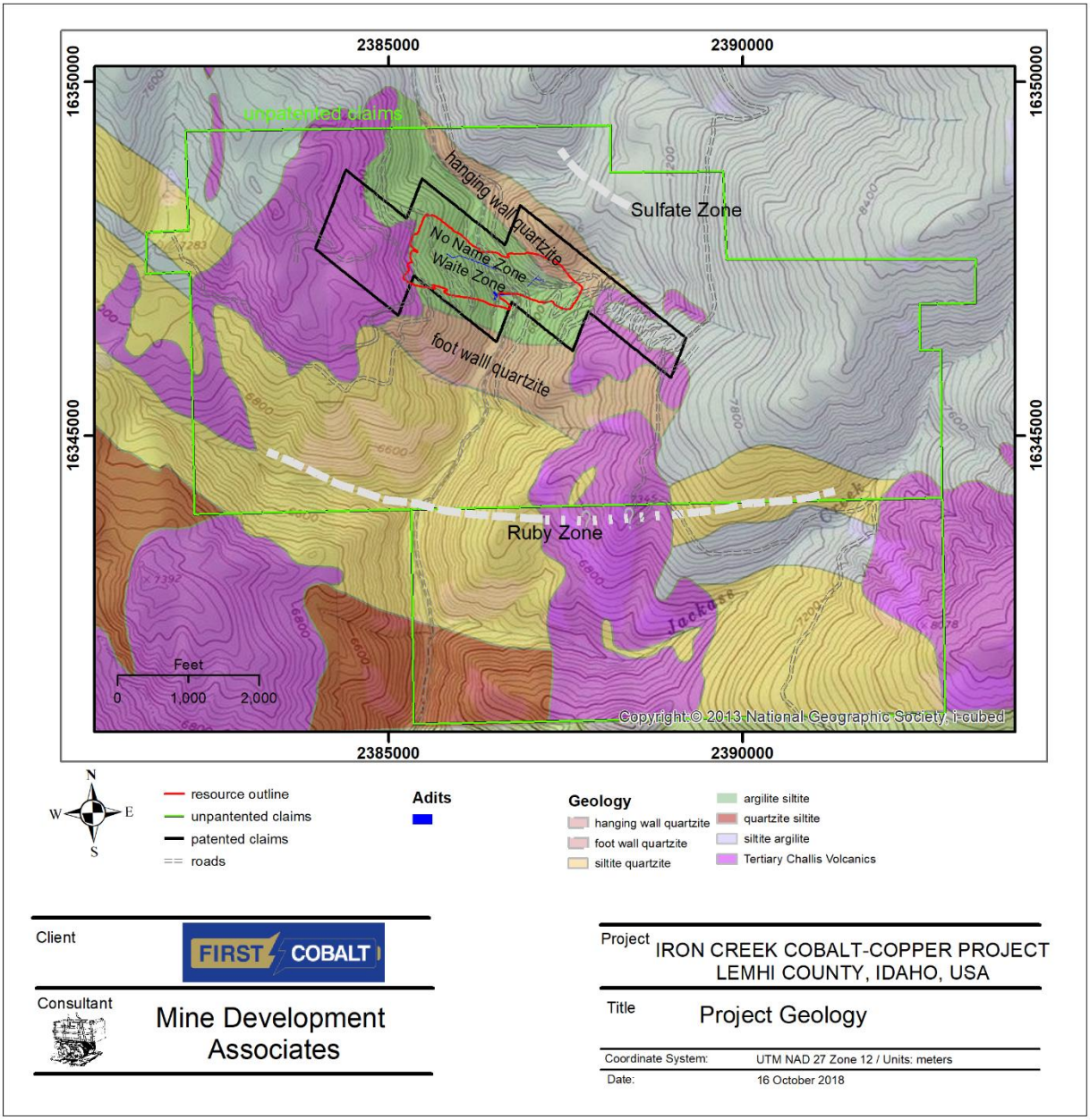
For the district, the following sequence of regional events has been recognized:

- Regional metamorphism to biotite-bearing assemblages occurred prior to 1.4 b.y.o;
- Intrusion of granitic plutons took place at about 1.4 b.y.o. and produced another pulse of metamorphism;
- Mafic dikes and/or sills of unknown age; and
- Late Cretaceous-Paleogene metamorphism occurred with intrusion of the Idaho Batholith (Nash and Hahn, 1986).

## 7.2 Property Geology

The property-area geology is shown in Figure 7.3. Northwest-southeast striking, moderately to steeply north-northeast-dipping metasedimentary rocks of the Apple Creek Formation form a graben bounded by normal faults that displace overlying units of the Challis Volcanic Group in the central and western portion of the property. According to Cullen (2016), "*Dominant, regional, north-northwest-striking faults and shear zones are subparallel to the northwest-striking metasedimentary rocks. At least some movement along these faults is post-metamorphism as, in places, metamorphic features (isograds) are offset.*" The Challis Volcanic Group units generally occur on the ridge tops. A combination of these volcanic rocks and well-developed soils conceal an estimated 80 to 85% of the underlying Apple Creek Formation. Proterozoic granitic rocks do not crop out in the Iron Creek area.

**Figure 7.3 Property Geologic Map**
(from First Cobalt, 2018)




Jones and Reeve (1989) concluded that the host rocks at Iron Creek are not in their original depositional configuration but have undergone intense penetrative deformation. Small, recumbent, isoclinal drag folds are common among the strata and compose fields of unique orientation and drag sense that can imply only the presence of much larger isoclinal folds. If this premise holds, the "layer-cake" assemblage is not a straight-forward, thick sequence of beds, but is composed of repeated and partly inverted smaller groups of strata that constitute nearly parallel limbs of large folds. The orientation relationships of drag folds, axial-plane phyllitic foliation and lineation are rigorous and are in accord

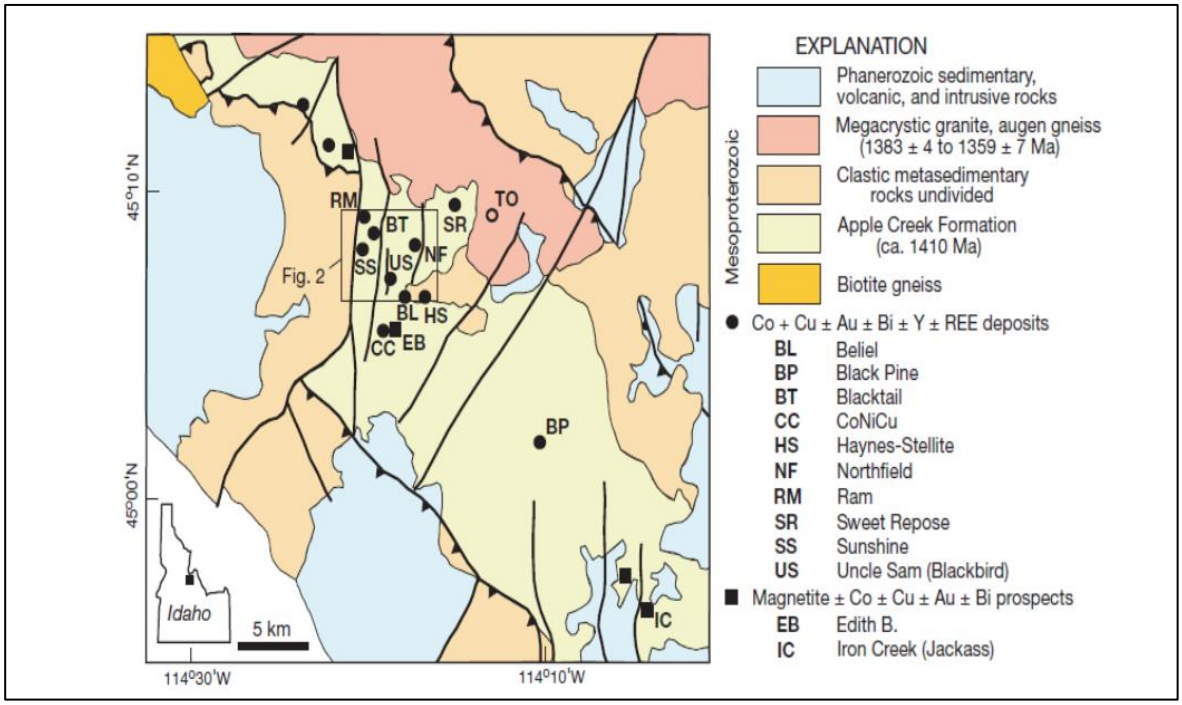
with the inference of major folds. However, modeling the cobalt and copper zones on section and in detail suggest that folding is minimal.

Cominco geologists also documented penetrative deformation of Proterozoic age, and a later, Cenozoic folding event based on their studies of drill core from the Iron Creek property (Hall, 1992). However, First Cobalt geologists emphasize the presence of well-preserved sedimentary features in other drill core samples, such as flame structures and ball-and-pillow structures, which they believe demonstrate a lack of isoclinal folds. First Cobalt interprets the Apple Creek Formation as an intact, northeast-younging stratigraphic sequence cut in some locations by bedding-parallel faults and shear zones (not shown in Figure 7.3).

## 7.3 Mineralization

The Iron Creek project is situated at the southeast end of the Idaho cobalt belt (Figure 7.4), which is defined by several deposits and prospects with cobalt, copper ± gold ± bismuth ± rare-earth element mineralization in Mesoproterozoic rocks of the Apple Creek Formation.

**Figure 7.4 Simplified Regional Geology of the Idaho Cobalt Belt**
(from Slack, 2012)




At Iron Creek, four zones of stratiform cobalt and copper mineralization are present within sequences of dominantly argillite and siltite and lesser phyllite and quartzite of the middle member of the Apple Creek Formation in and adjacent to the property. These are the No Name and Waite (formerly the Footwall No Name) zones in which the estimated resources are, and the Sulfate and Ruby zones (Figure 7.3), which are exploration targets. The host rocks strike north-northwest and dip 60° and 80° northeast.

The following descriptions on the mineral assemblage are based upon observations within drill core by the First Cobalt geology team.

The primary mineral assemblage observed consists of pyrite, chalcopyrite, pyrrhotite, and magnetite. Typically, the distribution of sulfide and magnetite mineralization is coincident with zones of moderate to intense shearing. Such shear zones are interpreted as conduits through which mineralizing solutions flowed and/or were remobilized. However, some zones of disseminated, very fine-grained pyrite are present within unsheared beds and laminations of the siltite units. The presence of shear strain has also led to some distinct styles of mineralization, such as pyrrhotite formed within pressure shadows around pre-existing pyrite grains. Such paragenesis indicates the possibility of multiple stages of mineralization.

Pyrite is the most widespread of the sulfide minerals observed at the Iron Creek project. In the drill core, pyrite varies from massive to blebby, and from coarse-grained disseminated crystals to very fine-grained patches and disseminations. It is typically subhedral to euhedral with octahedral pyrite more abundant than cubic pyrite.

Chalcopyrite varies from streaks and wisps to large blebs, is entirely anhedral to subhedral, and occurs intergrown with pyrite and pyrrhotite when the minerals are observed together. The bulk of the chalcopyrite occurs to the west of the North Fork of Iron Creek in the upper portion of the No Name zone, with fewer occurrences and lower concentrations to the east of the creek and in the Waite zone down section to the south..

Pyrrhotite occurs in two distinct habits which are both anhedral. One variant has a dull, metallic brownish-purple color and is weakly magnetic. The second variant has a lustrous, metallic reddish-brown color and is highly magnetic.

Magnetite is relatively uncommon and occurs in either a massive or fine-grained, disseminated habit. Massive magnetite within the No Name and Waite zones is typically found in highly sheared rocks and accompanies moderate to strong sulfide mineralization in bands and pods up to four inches thick in drill core. Fine-grained magnetite occurs in disseminated blebs and patches, typically within bedded to weakly sheared siltite and quartzite. This particular habit is much more widespread than the massive bands seen in highly mineralized zones, and does not appear to be associated with greater amounts of sulfide mineralization.

Native copper and arsenopyrite are essentially trace minerals that have been observed in the drill core. Dendritic native copper is almost exclusively fracture controlled with grains from <0.04in to 1.6in in length and has been observed intimately associated with a brecciated diabase dike in Adit-1. Arsenopyrite is quite rare and was observed mostly within the hanging wall quartzite of the No Name zone as very small clusters of anhedral grains.

Oxidation and weathering have formed shallow surficial zones of residual quartz, jarosite, goethite and hematite ± brochantite ± chalcanthite, as well as erythrite ($Co_3(AsO_4)_2 \cdot 8(H_2O)$), which has been observed around the portal of Adit-1 and at the massive magnetite exposure at the Ruby zone. The copper sulfate minerals are seen as thin fracture coatings and weak disseminations in and adjacent to

highly mineralized zones in Adit-1 and Adit-2 and in nearby drill holes. Oxidation levels are shallow across the property, generally less than 50ft deep, increasing to 80-100ft deep under North Fork of Iron Creek.

Both Hanna and Noranda conducted mineralogical and metallurgical studies on samples from the No Name Zone. Hanna's microscopic and X-ray studies indicated that the cobalt in the majority of the samples occurs in cobaltian pyrite (Mattson, 1972; Mattson, 1973). Noranda studied core from a high–cobalt zone with a scanning-electron microscope ("SEM") and also found that the cobalt occurs almost entirely in the pyrite (Snow, 1983). Noranda recognized two varieties of pyrite: a cobalt-rich variety, containing from 2.5% to 4.5% cobalt, and a cobalt-free type of pyrite.

First Cobalt commissioned SEM tests at American Assay Labs in Sparks, NV, and quantitative evaluation of materials by scanning electron microscopy ("QEMSCAN") tests at SGS Minerals in 2018. The results of these tests agree with the work performed by Hanna and Noranda, supporting the theory that the cobalt present at the Iron Creek project occurs largely or entirely within pyrite. These tests also concluded that there is a distinct lack of cobaltite. Relatively low levels of arsenic in assays from drill core support this conclusion, although a small amount of arsenic occurs with cobalt in highly mineralized zones. An anomalous mineral seen in drill core with a steel-grey to violet color and an isometric crystal form has yielded cobalt values upwards of 5% during X-ray fluorescence ("XRF") spot tests, and has tentatively been identified as the cobalt sulfide linnaeite ($Co^{2+}Co^{3+}{}_2S_4$).

### 7.3.1 No Name and Waite Zones

The No Name and Waite Zones, which presently contain all the estimated resources, are steeply dipping, tabular zones containing discontinuous layers and lenses of sulfide mineralization along bedding and sheared zones in a sequence of interbedded siltite, fine-grained quartzite, argillite, and phyllite. The mineralization consists of pyrite, chalcopyrite, pyrrhotite, magnetite and quartz with traces of native copper and possibly linnaeite. Oxidation and weathering have formed surficial zones of residual quartz, jarosite, goethite, hematite, brochantite, chalcanthite and rare erythrite.

The No Name zone is mostly hosted in a package of siltite and rhythmically interbedded siltite and fine-grained quartzite sandwiched between two thick beds of coarser-grained, massive to thick-bedded quartzite. This package is at the top of a section of interbedded siltite, quartzite, argillite and phyllite of the Apple Creek Formation which continues down beyond the footwall of the Waite zone. Margins of the bounding quartzite beds are commonly brecciated, and adjacent siltite beds strongly sheared, both of which appear to be contributing factors to more intensely mineralized areas within the zone. Sulfide mineralization is seen as bedding and fracture controlled massive to semi-massive zones, bedding controlled fine-grained disseminated pyrite, and narrow, rough veins or fracture fill cutting bedding.

The No Name zone as a whole is generally conformable to bedding of the Apple Creek Formation host rocks, although it does appear to drop down-section to some degree west of the North Fork Iron Creek, even though thickness and grade of cobalt mineralization remain fairly consistent and host rock lithologies are roughly the same. Additional detailed mapping is required to delineate possible sedimentary or metamorphic facies changes, mineral zoning, or structural offsets or influences that may

have caused this apparent shift. Up-section from the hanging wall of the No Name zone, the Apple Creek Formation becomes more phyllitic and quartzite beds are thinner and less common.

The Waite zone is separated from the No Name zone by a section of relatively un-sheared siltite and rhythmically interbedded siltite and fine-grained quartzite. Mineralization is not as clearly influenced by bedding compared to the No Name zone. Mineralization in the Waite zone roughly follows an irregular contact between packages of siltite and rhythmically interbedded siltite-fine grained quartzite, with discontinuous, coarser-grained quartzite beds along the footwall. The Waite zone appears to drop down in the stratigraphic section from east to west with a similar magnitude as the No Name zone. To the west of the North Fork of Iron Creek, significant mineralization in the Waite zone is bounded on the footwall by a series of 10-15ft thick quartzite beds that increase in frequency down section in the Apple Creek Formation to become the predominant lithology beneath the footwall.

The sulfide-magnetite components are concordant primarily with the flanking metasedimentary rocks, but cross-cutting veins have also been identified. These stratabound lenses are restricted to a unit predominantly composed of argillite, but within this unit, mineralization grades into and out of barren, chloritic siltite, argillite and impure quartzite. Occasionally, sharp contacts are present between the mineralized rock and the chloritic host rock. An association of mineralization with biotite-rich rock, which may represent a mafic tuff, also has been noted.

Currently available drill data show that cobalt and copper mineralization in the No Name zone are distinctly zoned with respect to each other and form separate but overlapping mineral domains. Cobalt is the principal metal to the east and copper is the principal metal to the west in the No Name zone. The cobalt and copper mineralization overlap in the central part.

### 7.3.2 Ruby Zone

The primary outcrop exposure of the Ruby zone is located approximately 5,000ft southeast of the No Name Zone adits and extends west-northwest from there (Figure 7.3). Little is known about the Ruby zone because drill holes collared above the zone were abandoned before penetrating the projection of the main mineralized horizon. Hole NIC-22 did encounter an estimated 100ft of disseminated chalcopyrite before it was abandoned in a "squeezing fault zone" (Chevillon, 1979). Centurion's holes were at convenient spots along the road for assessment purposes and did not test the zone.

Outcrop mapping (Noranda field team outcrop map) indicates there is mineralogic zoning similar to that of the No Name zone in that a magnetite-pyrite assemblage is confined to the footwall, and pyrite increases and magnetite decreases in abundance higher in the stratigraphic sequence. Unlike the No Name zone, there is an upper magnetite body in the hanging wall, which crops out along the road. Conformable magnetite-pyrite lenses are exposed over strike lengths of up to ~500ft and appear to grade laterally into unmineralized, chloritic rocks. These gradational zones appear to be relatively richer in pyrite and are characterized by interfingering lenses of pyrite, magnetite and chloritic rock. The chloritic rock has locally been strongly silicified. Crusts of what has been tentatively identified as erythrite are common on the magnetite outcrops.

Discordant lenses of magnetite breccia are also present in the footwall of the Ruby zone. These breccias are composed of 80% to 95% magnetite, up to 15% pyrite and 5% to 15% angular, spindle-shaped, lithic clasts.

Hanna's soil surveys and Noranda's grab rock-chip samples revealed that cobalt values appear to be associated with magnetite-rich rocks. Copper values are associated with veinlets and disseminations of chalcopyrite, which are locally anomalous in the contact zone of mafic dikes. (Chevillon,1979). The soil anomaly associated with the Ruby zone is down slope from the actual exposure of mineralization

### 7.3.3 Sulfate Zone

The Sulfate zone is located north of the No Name zone (Figure 7.3). Chevillon (1979) described the Sulfate zone as another example of stratabound, magnetite-rich mineralization. Conformable, narrow bodies of magnetite and pyrite resemble the mineralization in the Ruby and No Name zones, but no distinct mineralogical zoning is evident. Malachite is found in chloritic rocks in the area and a 7-10ft wide quartz vein with sparse pyrite and chalcopyrite is situated toward the footwall of the zone and is generally conformable with stratigraphy.

According to Bruce (1972):

> *"The original showing was found on the west wall of Big No Name Creek canyon. There, chloritic phyllite is heavily stained with malachite over a width of about 150 feet. Small 1/8 in.-1 in. quartz-iron oxide (boxwork) veinlets are common both parallel to and oblique to the foliation. In a few veinlets, scattered remnants of chalcopyrite are present. The name "Sulphate Zone" is apparently due to the presence of a secondary, greenish gray mineral that might be melanterite (FeSO4·7H2O).*
>
> *Approximately 800 ft southwest of the main showing, a large block (20 ft x 20 ft) of "bull" quartz was discovered. It appears to represent nearly complete replacement of the country rock by Sulphate[?]. Small patches of badly altered phyllite can be seen within the block. The outcrop is laced with small iron oxide, boxwork veinlets, but no sulfides or secondary copper minerals were noted.*
>
> *The geochem samples suggest that cobalt is not important in this zone.*
>
> *In summary, geological, geochemical, and geophysical data suggest a (discontinuous?) zone of mineralization at least 150 ft wide and at least 1,600 ft long. Chalcopyrite noted by L.H. Green near the collar of IC-4 O.D.H. is right on strike to the south and might lengthen the zone. The writer feels that the zone definitely merits further work similar to that already done, and that a drill hole is probably justified."*

The recommended hole was drilled and apparently yielded disappointing results (Centurion, 1990).

## 8.0 DEPOSIT TYPES (ITEM 8)

The following discussion is taken from Slack (2013) and Cullen (2016), with additional information from First Cobalt. Mr. Ristorcelli has reviewed this information and believes this summary accurately represents the Iron Creek project.

The cobalt and copper mineralization at Iron Creek belong to a class of deposits variably described as "Blackbird Co-Cu" (Evans et al., 1986) or "Blackbird Sediment-hosted Cu-Co" (Hõy, 1995). According to Evans et al. (1986), "*These deposits are stratabound iron-, cobalt-, copper-, and arsenic-rich sulfide mineral accumulations in nearly carbonate-free argillite/siltite couplets and quartzites*". There has been disagreement about the "Black-bird-type" origin and deposit formation processes, with some workers attributing the mineralization to sea-floor hydrothermal activity and associated, syn-sedimentary SEDEX or VMS deposition (e.g., Nash, 1989).

Slack et al. (2017) propose that the origin of these deposits is varied with a range of mineralizing processes, from diagenetic to epigenetic (the latter occurring both before and during metamorphism). In some deposits, geochronological and geochemical evidence suggests links to granitic and (or) gabbroic plutons, but the origin of most deposits of this type and their sources of the hydrothermal fluids and metals are enigmatic. Copper-cobalt deposits in Montana that occur within a stratigraphic-equivalent host-rock sequence are also considered to be associated with syn-sedimentary hydrothermal processes (Slack et al., 2017).

Others, including Slack (2013), have argued for an epigenetic origin of the mineralization in the Blackbird district, including that of the Iron Creek area, specifically. According to Hitzman (2017), post-sedimentary magmatic activity may have stimulated hydrothermal activity driving metal input akin to iron-oxide copper-gold systems.

While the genetic model for the mineralization is not definite, it does seem that Iron Creek is a syn-depositional, zoned copper and cobalt deposit that may have undergone some remobilization of metals during metamorphism. Some of the higher-grade mineralization preferentially occurs in strongly, ductily sheared rock, while the majority is disseminated to massive and parallel to bedding.

## 9.0 EXPLORATION (ITEM9)

First Cobalt (formerly STM, and U.S. Cobalt) commenced exploration of the Iron Creek property in 2016 with the compilation of historical geological, drilling, geophysical and geochemical data. In 2017 and 2018, First Cobalt rehabilitated about 1,260ft of underground workings in Adit-1 and Adit-2, which provide subsurface access to portions of the No Name mineralized zone. The objectives for U.S. Cobalt in 2017 were as follows:

- Diamond-core drill approximately 35,000ft from surface along a 1,500ft strike length of the No Name Zone, twinning historical holes in an effort to confirm and increase confidence in historical estimates of cobalt mineralization; and
- Re-habilitate the underground workings of the East Adit (Adit-1) and the 6500-level Adit (Adit-2) for underground diamond drilling and channel sampling.

During 2017, First Cobalt drilled 40 diamond-core holes from the surface, for a total of 34,704ft of core drilling (MDA resource database; see Section 10.0 for details). The aforementioned surface drill program was completed in December of 2017. In addition to twinning previous holes, the drilling further delineated portions of the No Name Zone and left the mineralized zone open to further expansion along strike. The 2017 drilling also identified a second mineralized zone stratigraphically lower than the No Name Zone called the Waite Zone, which may have been previously referred to as the Footwall No Name Zone. This drilling also encountered diabase dikes that cross-cut the Apple Creek host rocks. Adit-1 was fully rehabilitated and both of the portals for Adit-2 were excavated and partly rehabilitated during 2017.

In the first quarter of 2018, the rehabilitation of Adit-2 was completed. A total of 18,507ft were drilled in 29 core holes collared at surface and from underground locations in Adit-2 and Adit-1. The details of this drilling are summarized in Section 10.0 and the results have been incorporated in the estimated mineral resources presented in Section 14.0. Of the 29 holes, 25 were drilled in Adit-2 and four were drilled in Adit-1. All but two of the holes in Adit-2 were collared in a drill bay at the western face of the adit and were intended to extend the No Name and Waite Zones to the west, as well as explore possible copper targets to the north-northwest. The other two holes were drilled in a secondary bay approximately 300ft inside the portal and targeted the Waite Zone to the south. The four holes drilled in Adit-1 were designed to be collared in the No Name Zone and further explore the Waite Zone.

The entire length of Adit-1 was channel sampled and geologically mapped in detail by First Cobalt geologists. A total of 133 channel samples (each five feet in length) were collected from both ribs along the crosscut and drift in Adit-1. The samples were collected using air-powered chisels, with average sample weights of about 7.3lb. The underground channel samples were transported by a First Cobalt geologist from Adit-1 to the laboratory of American Assay Laboratories ("AAL") in Sparks, Nevada.

Road-cut sampling was started but not completed along the roads cross-cutting the No Name and Waite zones on the west side of the North Fork of Iron Creek.

During 2018, First Cobalt initiated mineralogical and petrograhic studies of mineralized material from the No Name zone. A total of 20 samples of drill core from 13 of the 2017 and 2018 drill holes were

sent to SGS Minerals ("SGS") in Lakefield, Ontario for detailed mineralogical descriptions. The purpose of the study was to identify and quantify metallic mineral species over a range of cobalt grades as identified by geochemical analyses. Specific attention was made in this study to identify cobalt-bearing minerals. Core logging and underground mapping found a diversity of pyrite textures and a range of grain sizes that had not been systematically analyzed for cobalt content.

The SGS Samples were derived from drill core and underground grab samples of pyrite-rich material. SGS prepared polished mounts of each sample for analysis using QEMSCAN, a standard method to derive high-resolution mineralogic images. Individual minerals are identified on each image manually by a mineralogist.

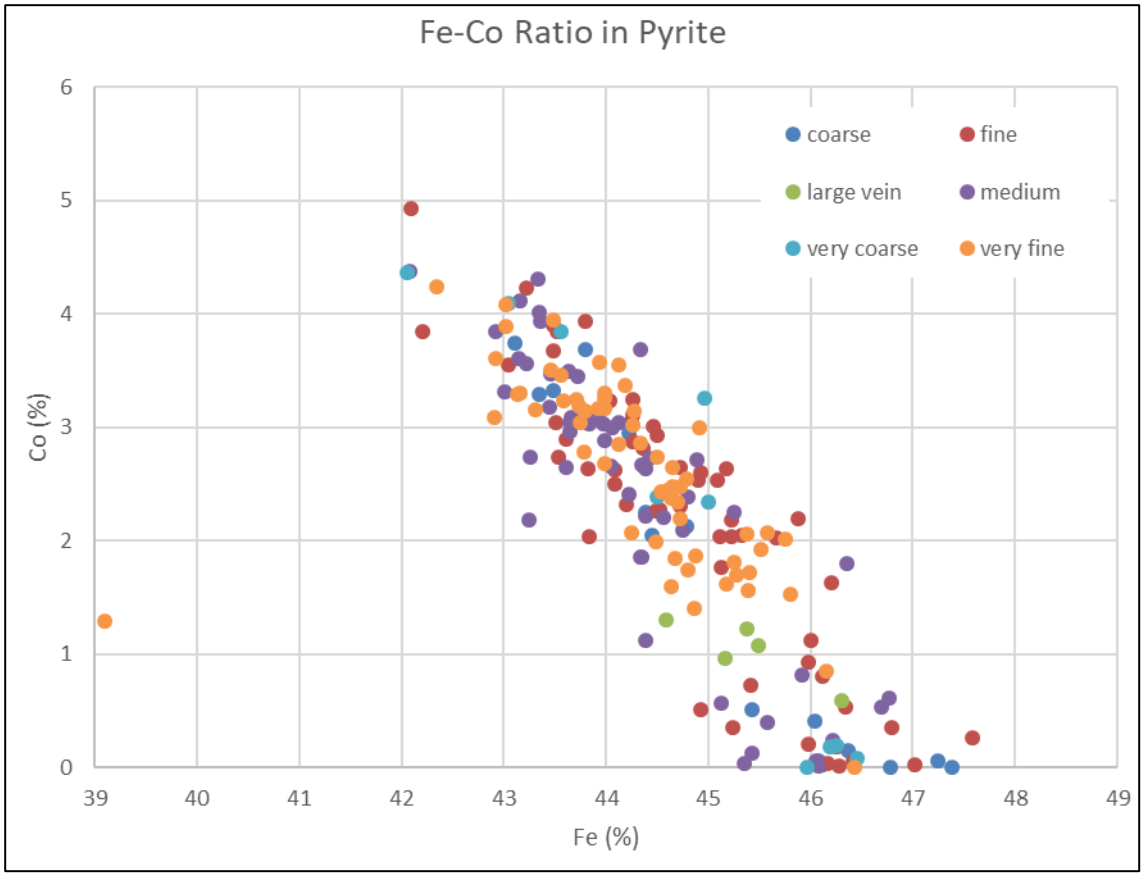
The principal metallic mineral in all 20 samples was pyrite. In six samples, chalcopyrite was identified to a maximum of over 14% in one sample. Pyrrhotite was identified in one sample. Magnetite and/or hematite are present in all samples; one sample contains over 75% iron oxide. The cobalt-bearing minerals cobaltite, glaucodot, and gersdorffite were identified in four samples, but generally are in minor concentrations (maximum of 0.33%). Arsenopyrite was not found in any of the 20 samples.

Further electron microprobe work was done to determine the cobalt concentration within pyrite relating to texture and grain size. Based on the QEMSCAN maps, pyrite grains were sub-divided as:

- Very fine grained - <50 µm;
- Fine grained – 50 to 200 µm;
- Medium grained – 200 to 700 µm;
- Coarse Grained – 700 µm to 1500 µm; and
- Very Coarse Grained - >1500 µm.

Based on the microprobe results, iron and cobalt demonstrate an inverse relationship (Figure 7.4) that reflects direct substitution within pyrite. High levels of cobalt occur in all sub-divisions of grain sizes. Images of cobalt concentration within pyrite show cobalt is entrained within the pyrite grain lattice appearing as "growth bands".

**Figure 9.1 Cobalt in Pyrite by Grain Size**
(from First Cobalt, 2018)




Mr. Ristorcelli has not analyzed the sampling methods, quality, and representativity of surface samples from the Iron Creek property because drilling results form the basis for the mineral resource estimate described in Section 14.0.

## 10.0 DRILLING (ITEM 10)

The information presented in Section 10 is derived from multiple sources, as cited. Mr. Ristorcelli has reviewed this information and believes this summary accurately represents the drilling conducted at the Iron Creek property.

### 10.1 Summary

MDA's project database contains records for a total of 143 holes drilled at the Iron Creek project from 1969 or 1970 through mid-2018, as summarized in Table 10.1. The collar locations are shown in Figure 10.1. Records for the historical drill holes are incomplete, but all are believed to have been drilled with diamond-core methods. The total footage drilled within the property is at least 101,789ft. Five of the holes were vertical (four historical and one drilled in 2017) and the balance were inclined with dips of +40° to -85°.

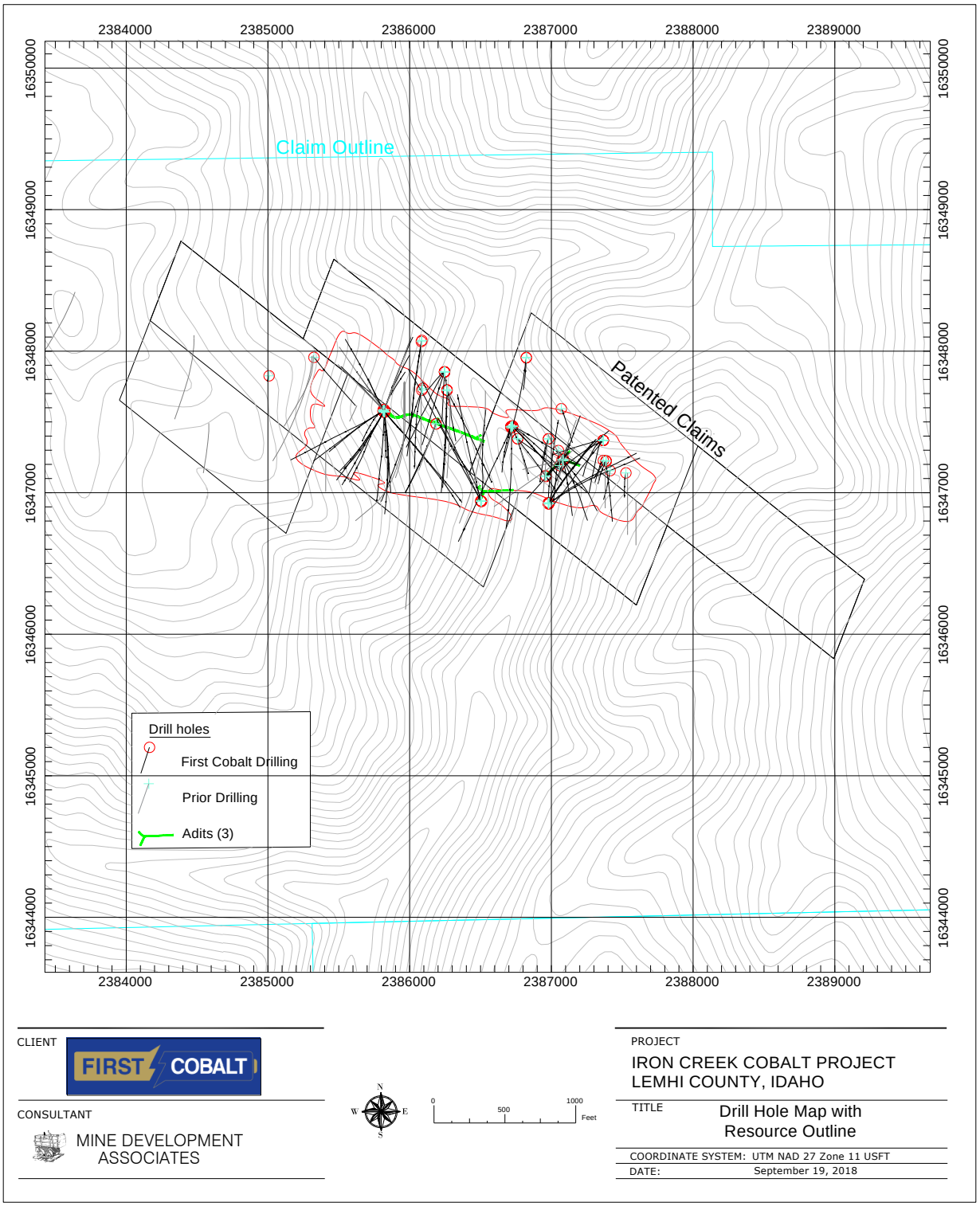
**Table 10.1 Iron Creek Drilling Summary**

| Year | Company | Core Holes | Feet | Comment |
|---|---|---|---|---|
| 1969 or 1970 | Wilson | 4 | 1,032 | |
| 1970 - 1971 | Sachem | 7 | 4,161 | 4 more holes not in MDA database |
| 1972 - 1974 | Hanna/Coastal | 15 | 12,736 | old reports state 13,250ft drilled |
| 1978 - 1979 | Noranda | 4 | 579 | 3 of these not in MDA database |
| 1985 | Inspiration | 1 | 467 | not in MDA database |
| 1989 - 1990 | Centurion | 4 | 1,398 | not in MDA database |
| 1996 | Cominco | 2 | 2,308 | |
| ? | unknown | 20 | 12,727 | historical holes by unknown companies |
| 2017 | First Cobalt | 40 | 34,704 | |
| 2018 | First Cobalt | 46 | 31,677 | |
| ***Totals*** | | ***143*** | ***101,789*** | |

### 10.2 Historical Drilling

Records of the historical drilling are limited to references in historical reports and plotted on historical cross sections. Although all of the drilling is believed to have been done with diamond-core methods, no information is available on the drilling contractors or rig types used, or the exact drilling and sampling procedures. Maps and sections in historical reports indicate that many of the holes were surveyed for down-hole deviation, but the type(s) of instruments and methods used are not known, and none of the down-hole deviation data are available. The results of the historical drilling were used by Hanna, Noranda and Centurion to estimate cobalt and copper "reserves" as summarized in Section 6.2.

## Figure 10.1 Map of Drill Holes in the Iron Creek Property



## 10.3 First Cobalt Drilling 2017 - 2018

First Cobalt began drilling in July of 2017 and by the end of the year a total of 34,704ft (MDA resource database) was drilled in 40 holes (Table 10.1). All of the 2017 holes were drilled from the surface using diamond-core and wireline methods to recover HQ- and NQ-diameter core. The drilling contractor was Timberline Drilling ("Timberline") of Hayden Lake, Idaho. Two modular Atlas Copco U8 underground type core drills were used. Both drills were operated on two 12-hour shifts each day.

The 2017 drilling was focused on the No Name zone to confirm, in fill and potentially expand the mineralized zones known from the historical drilling. The drilling did substantially confirm what was indicated in the pre-First Cobalt drilling.

In 2018, First Cobalt commenced underground core drilling in Adit-2 with Timberline as the drilling contractor. A single Sandvik DE-130 underground drill was used to drill 26 NQ-diameter diamond-core holes in Adit-2. A total of four core holes were drilled in Adit-1. Timberline also drilled 14 HQ-diameter diamond-core holes from the surface before being evacuated from the project area due to a wildfire. The 2018 surface drilling was carried out by Timberline with two Atlas Copco CS-14 track-mounted rigs, one modular Atlas Copco U8 underground rig and one UDR track-mounted rig.

The results of the 2017 and 2018 drilling have generally confirmed the cobalt and copper mineralization encountered by historical drilling in the No Name and Footwall (Waite) zones. Most importantly, the drilling has enabled First Cobalt to recognize that the cobalt and copper mineralized zones are distinct from each other, but overlap spatially in some areas. Representative cross-sections showing the 2017 to 2018 drilling results are presented in Section 14.3.1 and Section 14.3.2.

Drilling has continued in 2018 since the resource database effective date of August 27, 2018.

## 10.4 Drill-Hole Collar Surveys

MDA has no information on how the historical collar locations were surveyed by the historical operators. First Cobalt geologists were able to measure the locations of five or six historical drill collars with a hand-held GPS. The balance of the historical collar locations was taken from historical aerial photographs, maps and cross-sections. First Cobalt geologists identified these sites in the field and observed evidence of historical drilling. The collar locations of the 2017 and 2018 surface and underground core holes were surveyed by Wade Surveying with an RTK Total Station.

## 10.5 Down-Hole Surveys

Drill hole maps compiled by Cominco (Hall, 1992) show curved traces for many of the historical holes. MDA has no information on the methods and procedures or equipment used for the down-hole deviation measurements made for the historical drill holes.

For the 2017 surface core drilling, down-hole measurements were made by the drilling contractor using a REFLEX tool. The 2017 drill holes were sighted in by First Cobalt geologists using Brunton compasses and hand-held GPS, with front and back sights set before moving the drill to the pad A

REFLEX TM14 Gyro Compass was used to orient all of the 2017 and 2018 drill holes at the collar prior to and while starting the drill hole. All holes, surface and underground, were surveyed down-hole using a REFLEX multi-shot instrument and later corrected for magnetic declination of 12.9° East.

## 10.6 Summary Statement

Mr. Ristorcelli believes that First Cobalt's drilling and sampling procedures provided samples that are representative and of sufficient quality for use in the resource estimations discussed in Section 14.0. Mr. Ristorcelli is unaware of any sampling or recovery factors that materially impact the mineral resources discussed in Section 14.0.

# 11.0 SAMPLE PREPARATION, ANALYSIS, AND SECURITY (ITEM 11)

## 11.1 Historical Sample Preparation, Analysis and Security

Mr. Ristorcelli has no information on the methods and procedures used by historical operators for sampling, sample preparation, analysis and security. Because of this, combined with some doubt in actual locations of drill holes at the surface and at depth, the historical drill holes have been excluded from use in the estimation of mineral resources presented in Section 14.0.

## 11.2 First Cobalt Sample Preparation, Analysis and Security

First Cobalt's 2017 and 2018 drill core was transported by First Cobalt geologists from the drill sites to First Cobalt's core-processing facility in Challis, Idaho. Core recovery, rock quality designation ("RQD"), and bulk density were measured by First Cobalt geologists, and recorded in spreadsheets on notebook computers. Then whole-core digital photographs were taken. Following the photography, the core was sawn into two equal halves using an Almonte core saw and returned to the core boxes by technicians employed by First Cobalt's mining contractor, Earl Waite and Sons Mining Contractors.

After being sawn, First Cobalt geologists logged the core and inserted wooden core blocks to mark sample intervals taking into consideration lithological contacts and degrees of observed mineralization. Sample intervals varied from 1.0ft to 5.0ft. The log information was recorded directly into spreadsheets in notebook computers. After the completion of the logging, the geologists removed the half-core sample intervals and placed them in pre-numbered sample bags which were closed with ties. The bagged samples were then placed in either plastic super sacks, or plastic collapsible bins, along with blanks, certified reference materials (standards) and duplicate half-core samples. The duplicates, blanks and standards were inserted at a frequency of one for every five regular samples and were alternated throughout the length of the hole.

Beginning in mid-2018, after logging and sampling of the entire hole were completed, a second set of photographs was then taken of the sawn half core, with the sample intervals marked and visible. All of the samples were then removed from the corresponding super sack or bin and inventoried prior to shipment. The samples ready for shipment were stored at the First Cobalt core facility and then transported by truck to AAL in Sparks, Nevada. AAL is an independent commercial assay laboratory that is accredited under ISO/IEC 17205:2005 and is independent of First Cobalt. The core boxes containing the remaining core are stored at the secure core facility for future reference.

At the AAL laboratory, the drill core samples were oven dried, weighed, crushed in their entirety to 85% passing 6 mesh, and roll crushed to 85% passing 10 mesh. The crushed samples were then split to obtain 250g sub-samples that were pulverized to 95% passing 150 mesh.

AAL analyzed some of the drill samples by inductively-coupled plasma atomic-emission spectrometry ("ICPAES") using a 4-acid digestion of 2.0g aliquots of the sample pulps to determine Co, Cu, and 43 major, minor and trace elements (AAL method code ICP-5A; for Ag, Al, Ba, Be, Ca, Cd, Ce, Cr, Ga, Hf, Hg, Fe, K, La, Li, Mg, Mn, Mo, Na, Nb, Ni, P, Pb, Rb, S, Sb, Sc, Se, Sn, Sr, Ta, Te, Th, Ti, Tl, U, V, W, Y, Zn, and Zr). Other drill samples were analyzed by ICPAES using a 4-acid digestion of a 0.5g

aliquot of the sample pulps to determine Co, Cu, and 32 major, minor and trace elements (AAL method code ICP-4A). For many of the samples analyzed by ICP-4A, a separate 2.0g aliquot was analyzed by ICP-5A for Co that was in excess of the upper limit of detection of the ICP-4A analyses. In some cases, Cu and Zn were also determined by ICP-5A. In yet other cases, drill samples that were analyzed by ICP-4A were also analyzed by ICPAES using a 2-acid (aqua regia) digestion of 0.5g aliquots of the sample pulps to determine Cu plus Ag, As, Ca, Fe, Hg, Mo, Pb, S, Sb, U and Zn (AAL method code ICP-2A), and Co was also determined by 4-acid digestion ICPAES of a 2.0g aliquot (ICP-5A).

Channel samples were taken from the ribs of the underground workings in Adit-1 by First Cobalt geologists in continuous 5ft intervals using air-powered chisels. Depending on their locations, the channel samples were taken either perpendicular to layering of the host rock sequence and stratiform mineralization, or oblique to the mineralization. Blanks, duplicates and certified reference materials were inserted at the rate of about one for every five channel samples. The closed sample bags were transported by First Cobalt geologists to AAL in Sparks, Nevada.

At AAL, the channel samples were prepared with methods similar to those for the drill core described above. From each sample pulp, aliquots were extracted and analyzed for Au, Pd and Pt by fire assay with an ICPOES finish. Separate aliquots of 0.5g of each sample pulp were subjected to a 4-acid digestion followed by ICPAES determinations of Co, Cu, and 32 major, minor and trace elements (AAL method code ICP-4A). Co was also analyzed by ICPAES following 4-acid digestion of another 2.0g aliquot (AAL method code ICP-5A). Two-acid (aqua regia) digestions on 0.5g aliquots followed by ICPAES determinations of Ag, As, Ca, Co, Cu, Fe, Hg, Mo, Pb, S, Sb, U, and Zn, were also done on all of the channel samples.

## 11.3 Quality Assurance/Quality Control

MDA has no information on the quality control/ quality assurance ("QA/QC") methods and procedures used by historical operators, but the historical drill data has been excluded from use in estimation of the mineral resources presented in Section 14.0. The QA/QC procedures and methods used by First Cobalt are summarized and discussed in Section 12.3, along with Mr. Ristorcelli's evaluation of the QA/QC data. Mr. Ristorcelli concludes that the sample preparation, security and analytical procedures, as well as the QA/QC (see Section 12.5), are acceptable and the drilling samples can be used in resource estimation. However, the underground sample assays should not be used in estimation but can and were used for domain modeling.

## 12.0 DATA VERIFICATION (ITEM 12)

Data verification, as defined in NI 43-101, is the process of confirming that data has been generated with proper procedures, has been accurately transcribed from the original source and is suitable to be used. There were no limitations on, or failure to conduct, the data verification for this report. Additional confirmation of the drill data's suitability for use are the analyses of the Iron Creek project QA/QC procedures and results as described in Section 12.3.

### 12.1 Site Visit

Mr. Ristorcelli visited the Iron Creek project office and field site on the 18th and 19th of June, 2018. During this site visit, the project geology was reviewed, which included: a) a field tour of the deposit area; b) visual inspection of core holes; and c) discussion with First Cobalt personnel of the current geologic interpretations. Drill site and mineralization verification procedures were conducted, and core drilling and sampling procedures were appraised. Mr. Ristorcelli has also maintained a relatively continual line of communication through telephone calls and emails with First Cobalt project personnel in which the project status, procedures, and geologic ideas and concepts have been discussed. The result of the site visits and communications is that Mr. Ristorcelli has no significant concerns with the project procedures.

### 12.2 Database

In June of 2018, First Cobalt tasked MDA with initializing and maintaining a GeoSequel® relational database of drill, sample, assay, survey and QA/QC data at the Iron Creek property. After validating the early 2018 and older project data, MDA organized it and imported it into GeoSequel using the import tools available. Information imported included collar data, down-hole survey data, coordinates, and all down-hole sample intervals taken. MDA then created Transmittal import sheets and imported the assay data directly from the laboratory certificates supplied by First Cobalt. For the remainder of 2018, laboratory certificates were downloaded directly from AAL.

All the drill-hole geology was imported from spreadsheets supplied by First Cobalt personnel, as well as the core recovery and density data, and checked for reasonableness. After each round of importing data, a series of data validations were run to check for unlikely or erroneous data. Any issues found were corrected within the database in an iterative process. Data was output for modelling directly from GeoSequel.

The 2018 down-hole and collar survey data were received directly from the drillers and surveyors, respectively.

### 12.3 Quality Assurance/Quality Control

First Cobalt inserted blanks, certified reference materials ("CRMs" or "standards") and duplicate core samples into the sample stream. In addition to those samples, the laboratory also inserted internal QA/QC samples, and those data were evaluated, but were used more by MDA for defining material heterogeneity rather than QA/QC. Duplicate core samples and internal-lab QA/QC samples do not

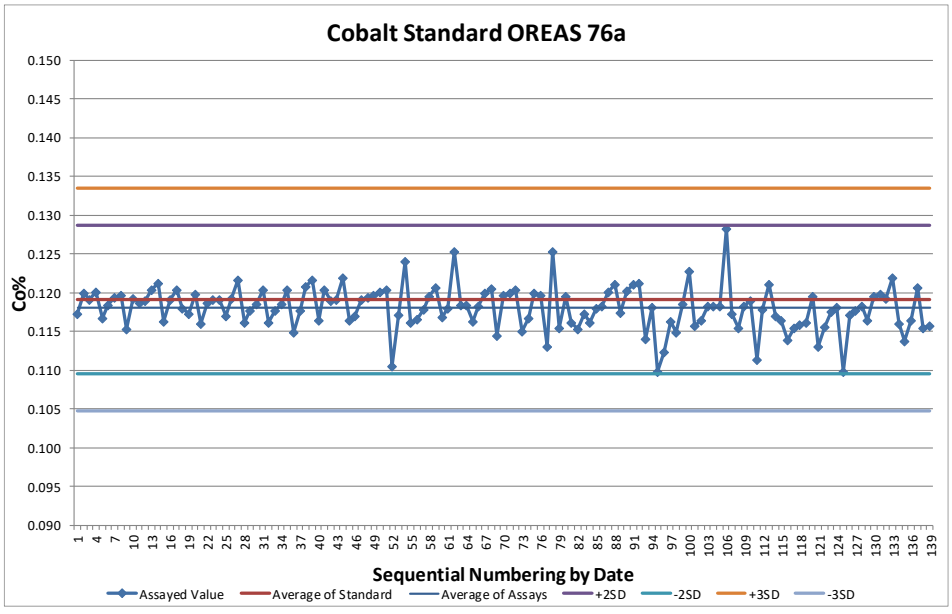
provide for full or independent QA/QC evaluations, but they do provide valuable information. MDA used the standards for evaluating the reliability of the assay data and used the duplicate core and internal laboratory duplicate assays on the same pulps to evaluate material heterogeneity, as well as to gain some insight into sample reliability.

During 2017 and much of 2018, there were three QA/QC samples inserted per 15 core samples in each submittal: one blank, one standard, one duplicate. The blanks were generally inserted in and around visually mineralized zones, the duplicates were biased towards competent zones preferably in and around mineralization, and the standards were inserted to make up the 1:5 ratio on the submittal.

### 12.3.1 Standards (CRMs)

Nine different CRMs have been used in First Cobalt's drilling programs. All nine have certified cobalt values, but only four have certified copper values. At the time of the analysis, there were 1,298 assays of CRMs, of which 23 were considered failures, for a failure rate of 1.8%. Mr. Ristorcelli uses the term failure because the cobalt or copper values fell outside of three standard deviations of the mean. Upon closer inspection, 15 of those "failures" may have been due to recording errors because the values returned matched the expected values of a different CRM. Removing the mis-recorded CRMs from the total, the failure rate drops to 0.6%. And of the remaining eight failures, seven were from one CRM: OREAS 77a. There is some drift in the mean grade returned for two cobalt CRMs beginning around June 2018, one drifting positive and one negative. Overall, MDA finds that the CRMs inserted into the sample stream demonstrate that the assay values returned from the laboratory have enough accuracy to be used in resource estimation, but more care must be used in sample handling and recording, as well as an investigation into the reliability of CRMs OREAS 77a and OREAS 165. None of the failures were sent in for re-assay. An example of the 14 graphs made to evaluate the results of the cobalt and copper CRMs is shown in Figure 12.1.

**Figure 12.1 Cobalt Standard OREAS 76a Results**



### 12.3.2 Duplicate Samples

Duplicate samples were evaluated by comparing the duplicate sample to the original sample using the equation given below:

$$\textbf{Equation 1} \qquad 100\ x\ \frac{(Duplicate - Original)}{Lesser\ of\ (Duplicate, Original)}$$

Plots made using this equation show the maximum differences to better find relationships that might otherwise be too subtle to recognize.

#### 12.3.2.1 Core Duplicates

There were 727 duplicate-core samples each with cobalt and copper results. The duplicate-core samples consisted of ¼ core sawed from the same half of the core. While assays on the duplicate core do not necessarily provide specific quality-control information, they do provide insight into material heterogeneity, and they define reproducibility of values which can provide a sense of reliability.

The relative difference plot was made after removing seven extreme outlier samples (0.96%) from the data set because they skewed the results sufficiently to mask finding actual relationships. Figure 12.2 shows the relative difference plot for cobalt. For the most part, the differences of the duplicate sample were not biased compared to the original assay for all grade ranges less than 0.07% Co. However, above that grade the duplicate samples were biased high by about 5% for cobalt. While on site reviewing the sampling procedures, Mr. Ristorcelli did not see any procedures that may have imparted this bias. This bias was not observed in the copper assays from duplicate-core samples.

As shown in Figure 12.3, the reproducibility of cobalt grades increases at grades greater than 0.03% Co. This magnitude of difference is expected because the cobalt occurs in, or with, pyrite, which can occur in blebs that are not evenly disseminated through the rock.

There is no bias in the copper grades (Figure 12.4). Reproducibility is more variable in copper (Figure 12.5) than in cobalt, likely because chalcopyrite grains are larger and more variable than the generally finer-grained cobaltiferous pyrite.

#### 12.3.2.2 Pulps Samples

There were 112 duplicate-pulp cobalt results and 91 duplicate-pulp copper results from the same laboratory (AAL). The reproducibility of cobalt in pulps is about 2% (Figure 12.6) and that of copper is about 4% at meaningful grade ranges (Figure 12.7). Copper has some unexplained erratic results. No biases in the grades were expected or found.

**Figure 12.2 Cobalt in Duplicate Core Samples: Relative Difference**

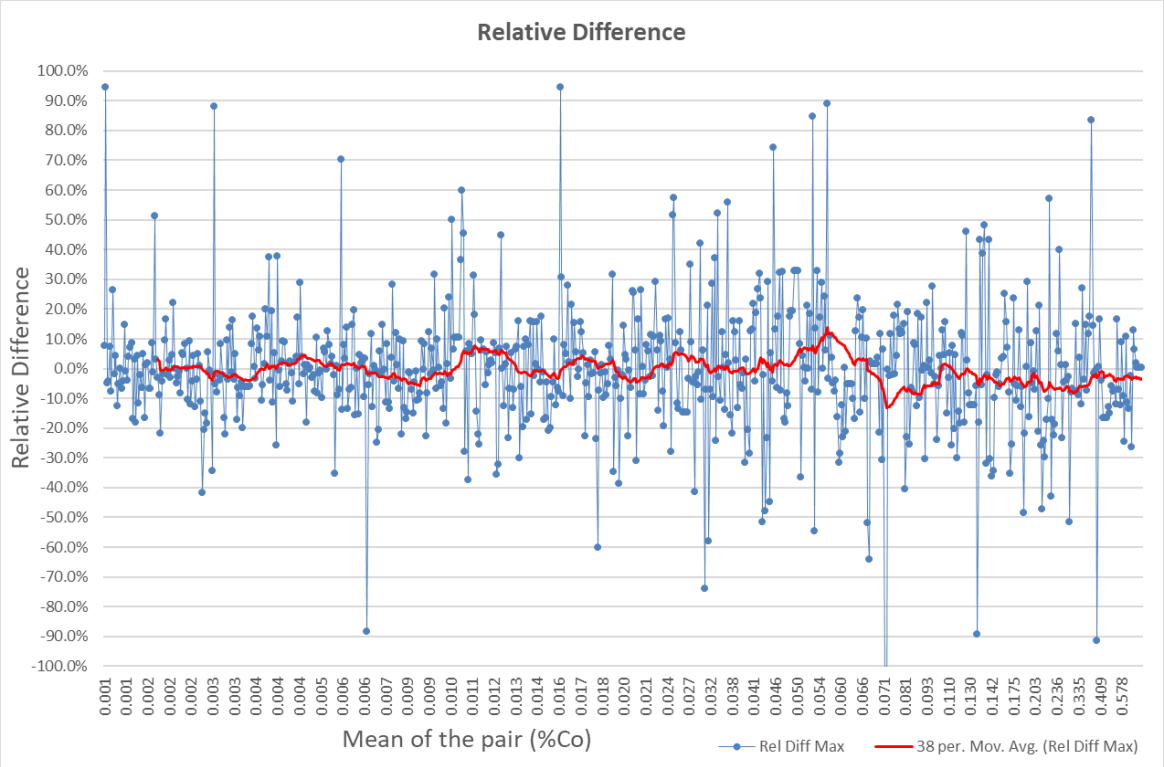



**Figure 12.3 Cobalt in Duplicate Core Samples: Absolute Value of Relative Difference**

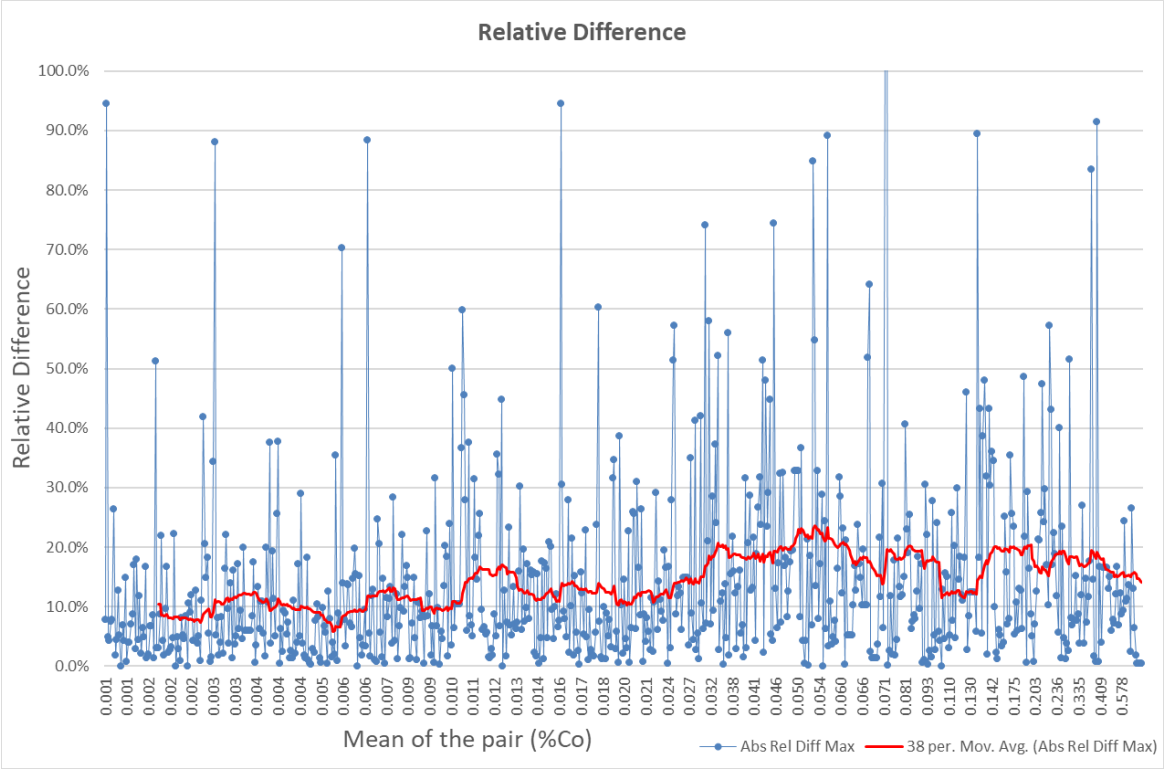


**Figure 12.4 Copper in Duplicate Core Samples: Relative Difference**

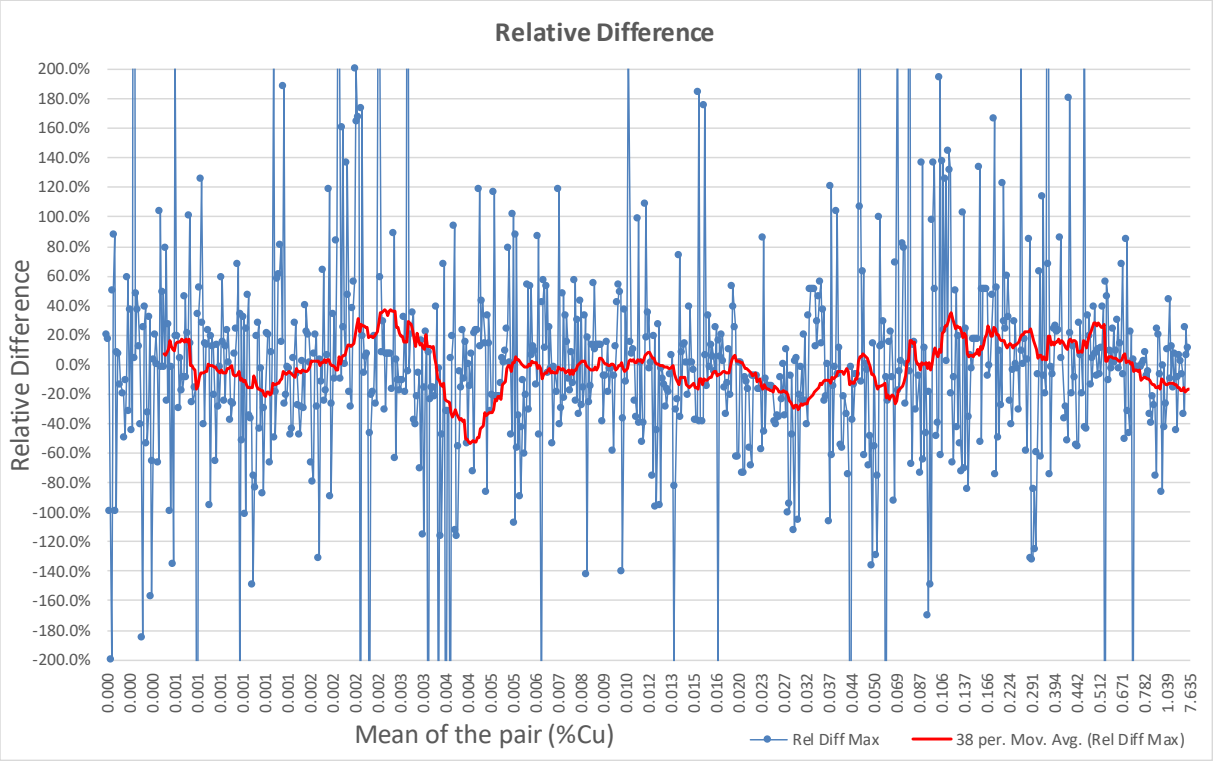



**Figure 12.5 Copper in Duplicate Core Samples: Absolute Value of Relative Difference**

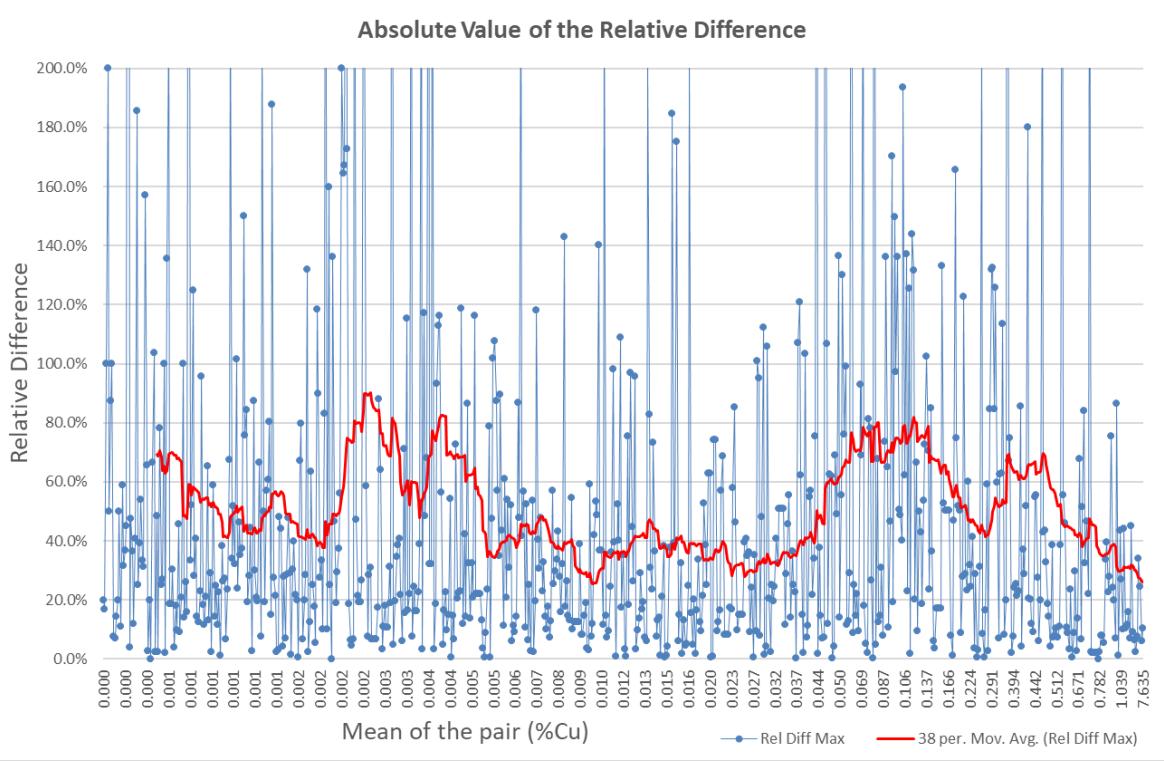


**Figure 12.6 Cobalt Assays in Duplicate Pulp Samples**

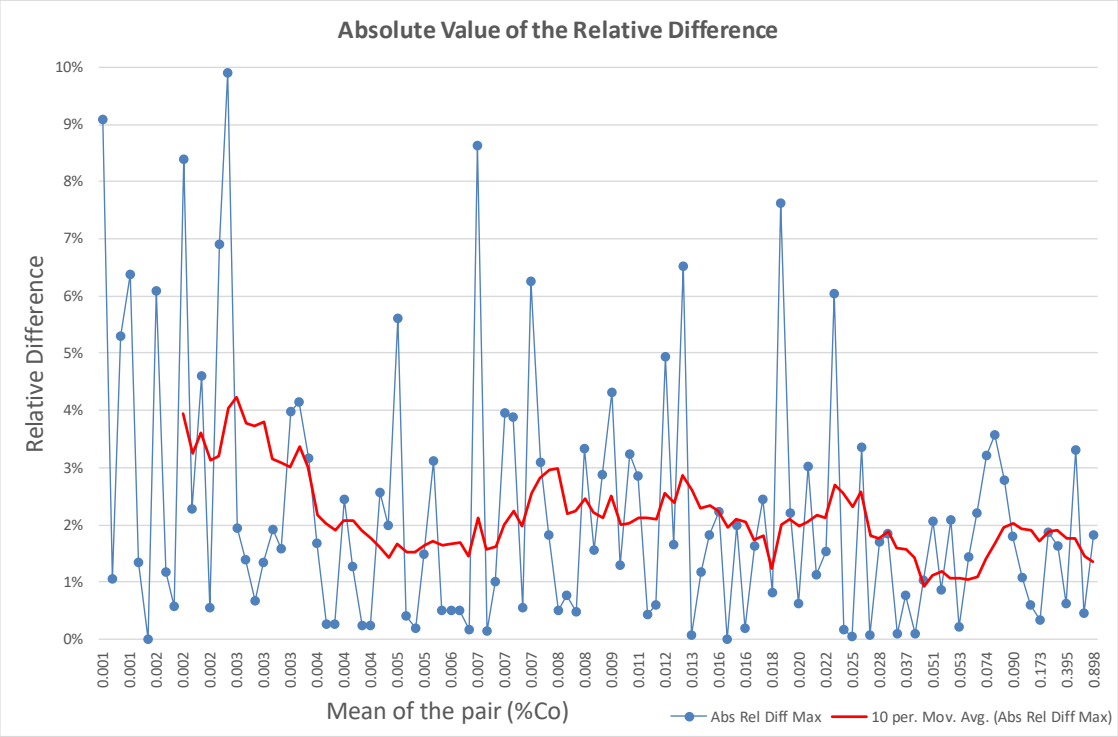
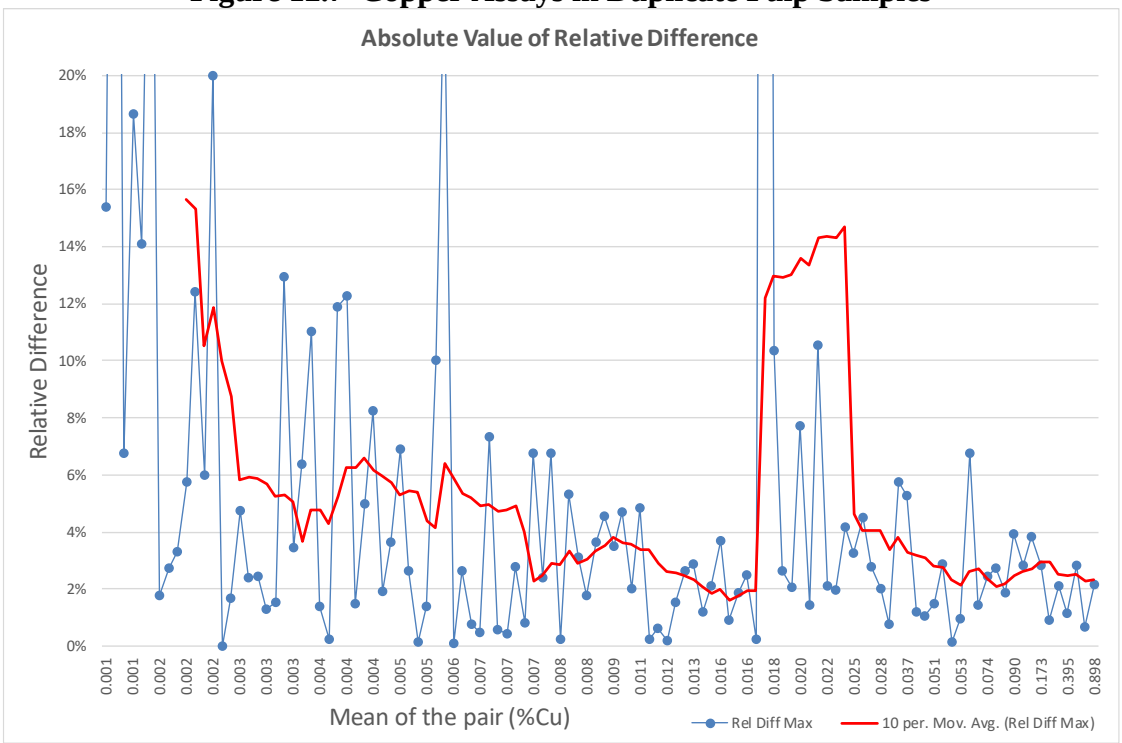



**Figure 12.7 Copper Assays in Duplicate Pulp Samples**



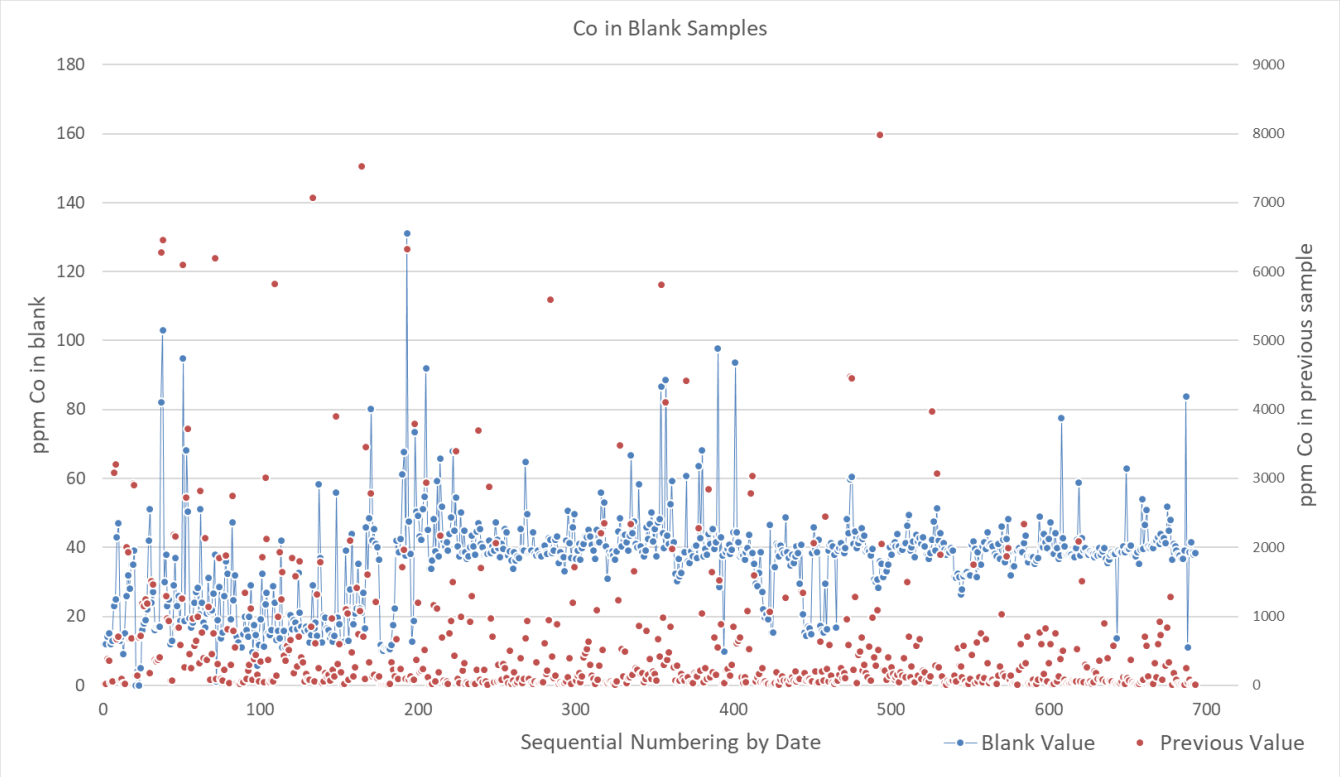
### 12.3.3 Blanks

First Cobalt used fine-grained siliciclastic rock of the Yellowjacket Formation taken from the property for coarse blank material to monitor the possibility of contamination during sample preparation and analysis. In the data available to MDA, there were 693 analyses of cobalt in blanks and 700 analyses of copper in blanks. The blanks were generally inserted into the sample stream around visibly mineralized zones.

Nine of the 693 cobalt assays in the blanks were distinctly anomalous with grades higher than the previous sample in the sample stream. Those nine blank samples ranged in grade from 360ppm Co to 2,106ppm Co. It is possible that these blank samples were in fact not blank, and/or there were some sample-handling or mis-labeling issues. The great majority of cobalt assays on the blanks were at or below 60ppm Co, which is about three times the average for shale and siltstone, and about 10 times the average for rhyolite or granite. Most of the anomalous samples were from early in the program.

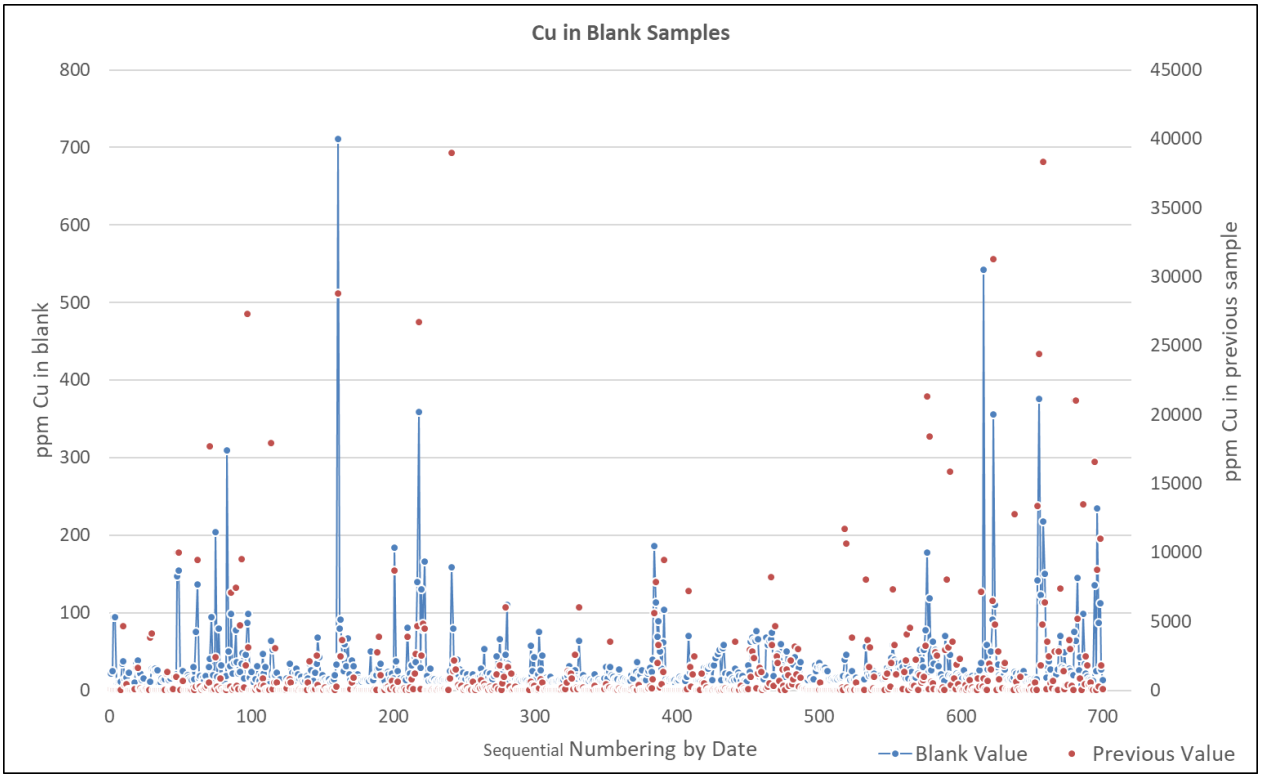
Figure 12.8 is a chart showing the cobalt analyses in the blanks, and in the previous drill samples in the sample stream. There is no meaningful evidence that the grades reported for the blanks are related to the grades in the preceding samples, so between-sample contamination is considered to be minimal. However, there was a distinct albeit unimportant increase in blank sample cobalt values, which may have coincided with a change from decorative yard rock to locally obtained siliciclastic material.

**Figure 12.8 Cobalt in Blanks and Preceding Samples**



There were no distinctly anomalous values in the 700 copper assays of blank samples, but there is some evidence of minor, but insignificant carry-over sample contamination. The great majority of copper assays on the blanks were at or below 50ppm Cu. There is a moderate relationship between grades of the blanks and previous samples, but, as shown in Figure 12.9, the anomalous blank samples are clustered in the graph around where the previous samples are generally higher grade. While there is some evidence of grade carryover between samples, the amount is negligible.

**Figure 12.9 Copper in Blanks and Preceding Samples**




### 12.3.4 Discussion of QA/QC Results

The QA/QC samples inserted in the sample stream demonstrate that sampling, sub-sampling and analyses yield results suitable for reliable resource estimation. However, some additional care must be used when handling samples and recording sample numbers. The suitability of one of the CRMs should be checked. First Cobalt can use a blank material with lower concentrations of cobalt. Rhyolite of the Challis Volcanic Group exposed within the property should contain less than 10ppm Co.

## 12.4 MDA Independent Verification of Mineralization

Mr. Ristorcelli collected six samples of ¼ core for independent analysis. The samples were sent to ALS Laboratory Group ("ALS") in Reno, Nevada. ALS used their ME-ICP61 "near total" digestion with inductively-coupled plasma mass spectrometry ("ICP-MS") finish. The results show that the grades in the database are substantially the same as those received with MDA's independent samples (Table 12.1).

While not a statistically significant data set, five of the six samples returned lower cobalt grades. This is probably a reflection of the analytical procedures more than a reflection of sample biases.

**Table 12.1 Cobalt and Copper Assays from MDA Verification Samples 2018**

| | | | | Original | | Diff. (Dup/Orig) | | MDA Duplicate | |
|---|---|---|---|---|---|---|---|---|---|
| Sample | Hole | from (ft) | to (ft) | Co% | Cu% | | | Co% | Cu% |
| ICMDA-1 | IC18-19 | 164.0 | 167.0 | 0.008 | 5.092 | -28% | -41% | 0.006 | 3.010 |
| ICMDA-2 | IC17-06 | 415.0 | 420.0 | 0.221 | 0.025 | -44% | -49% | 0.123 | 0.013 |
| ICMDA-3 | IC17-23 | 360.0 | 364.0 | 0.036 | 0.071 | -23% | 32% | 0.028 | 0.094 |
| ICMDA-4 | IC17-39 | 829.6 | 831.3 | 0.524 | 0.002 | 25% | 65% | 0.657 | 0.003 |
| ICMDA-5 | IC17-39 | 826.6 | 829.6 | 0.146 | 0.001 | -36% | 0% | 0.094 | 0.001 |
| ICMDA-6 | IC17-06 | 315.0 | 320.0 | 0.460 | 0.108 | -16% | -33% | 0.387 | 0.073 |

## 12.5 Summary Statement on Data Verification

Data verification, as defined in NI 43-101, is also the process of confirming that data has been generated with proper procedures, has been accurately transcribed from the original source and is suitable to be used. There were no limitations on, or failure to conduct, the data verification for this report. The database was constructed by MDA from original or near original data sources. A site visit was made which showed that reasonable exploration procedures are in place. Mr. Ristorcelli's evaluation of QA/QC data found that samples and analytical procedures are sufficiently reliable to be used in support of a resource estimate at any level of the CIM classifications.

## 13.0 MINERAL PROCESSING AND METALLURGICAL TESTING (ITEM 13)

This section was prepared under the supervision of Mr. William Joseph Schlitt of Hydrometal Inc. and McClelland Laboratories Inc. in Sparks, Nevada. The information presented in this section is derived from multiple sources, as cited. Mr. Schlitt has reviewed this information and believes this summary accurately represents the mineral processing and metallurgical testing conducted with mineralized material from the Iron Creek property.

### 13.1 Historical Testing

Metallurgical testwork dates to the early 1970s when studies were done by Hanna and its subsidiary Coastal. Apparently Noranda also undertook some metallurgical testing at a later date. The original metallurgical files or reports have not been made available. The only sources of metallurgical information are summaries by others (e.g., Ristorcelli, 1988; Centurion Gold, 1990).

The work done by Hanna/Coastal showed that the coarse sulfides were well liberated and could be floated as a bulk concentrate. A copper concentrate was then produced with excellent recovery. This concentrate contained about 0.5oz Ag/ton and 0.2% arsenic. The cobalt was rejected with the pyrite in the tailings. Concurrent mineralogical examination showed that the bulk of the copper was present as chalcopyrite. Little discrete cobalt mineralization was detected, indicating that most cobalt was contained within the pyrite structure as cobaltian pyrite. The cobalt content ranged from about 2.0 to 4.0%. Additional pyrite, probably from a different depositional event, was found that was completely devoid of cobalt. These observations strongly suggest that the maximum cobalt content in the concentrate will be limited by the solubility of the cobalt in the pyrite structure.

### 13.2 Metallurgical Testing by First Cobalt 2018 (McClelland Laboratories)

McClelland Laboratories Inc. ("McClelland") in Sparks, Nevada, was commissioned by First Cobalt to undertake metallurgical testing commencing in 2018. McClelland received samples of drill core from four holes drilled in 2017, but the cobalt and copper contents were low and the core was not tested. First Cobalt then extracted two bulk samples from Adit-1 and one from Adit-2, which were received by McClelland in May of 2018. At McClelland the sample identifications of ICA1-SE, ICA1-SW and ICA2 were checked against First Cobalt's sample manifest. Then each sample was weighed, photographed and given a unique laboratory number so that the sample chain of custody could be maintained until the material was either returned to First Cobalt or was disposed of. If two or more samples are to be combined to produce a composite for testing, that composite will be given a new laboratory number for tracking purposes. Once the samples were logged in, they were placed in a freezer to prevent any possibility of sulfide oxidation during storage.

The three adit samples were found to be mostly greater than 2in in fragment size. As a result, after each sample was thoroughly blended sufficient material was split out and set aside for eventual comminution tests. Then material was split out for head assays. Each sample was assayed in triplicate for cobalt and copper, with single assays for additional components. For the triplicate assays, precision exceeded 98% for five of the six sets of assays. Precision exceeded 96% for the sixth set of assays. The head assays

for the three bulk samples are summarized in Table 13.1, with sulfate sulfur calculated as the difference between the total and sulfide sulfur values.

**Table 13.1 Adit Bulk Sample Head Assays**

| Analyte, Units | McClelland Bulk Sample Identification | | |
|---|---|---|---|
| | 4313-001 | 4313-002 | 4313-003 |
| Ag, ppm | 5 | 5 | <1 |
| As, ppm | 619 | 426 | 713 |
| Ave. Co, ppm | 4,287 | 2,596 | 2,653 |
| Ave. Cu, ppm | 8,659 | 9,966 | 1,250 |
| C – Total, % | 0.15 | 0.13 | 0.09 |
| C – Organic, % | 0.06 | 0.02 | 0.04 |
| S – Total, % | 11.4 | 7.84 | 10.3 |
| S – Sulfide, % | 8.63 | 4.47 | 6.06 |
| S – Sulfate, % | 2.77 | 3.37 | 4.24 |

*Note: sample 4313-001 is ICA1-SE; sample 4313-002 is ICA1-SW; and sample 4313-003 is ICA2.*

Two of the bulk samples have head grades approaching 1% copper, while the third has a much lower copper content. All three have cobalt values in the range of 0.25 to about 0.40%. There was agreement that these three samples would be suitable for the initial flotation testing.

The first step in the initial flotation testing was to determine the optimum grind size for each bulk sample. This involved running several rougher flotation tests where 80% of the feed passed grind sizes of 212, 106, 75, 53 or 45 microns. The optimum grind size was determined by plotting cobalt recovery and concentrate grade vs. feed size. A typical grind size plot is shown in Figure 13.1.

The grind size optimization tests were very consistent. All three bulk samples produced the same result, with the optimum grind size being 80% of the material passing a screen size of 75 microns, i.e. a $P_{80}$ of 75µm.

The first set of flotation tests involved a series of rougher floats to determine if bulk sulfide concentrates could be recovered that contained high percentages of both cobalt and copper. Two rougher tests were conducted on each bulk sample. All tests utilized a consistent set of reagents (with or without copper sulfate additions) and were performed at 33wt. % solids and the natural pH (pH 6 to 8). Results are summarized in Table 13.3.

All three bulk samples responded well in the rougher flotation tests. The mass pull averaged about 28% with more than 96% of the sulfide sulfur contained in the resulting concentrate. About 96% of the cobalt also reported to the sulfide concentrate.

**Figure 13.1 Grind Size Optimization Plot for 2018 Bulk Samples**

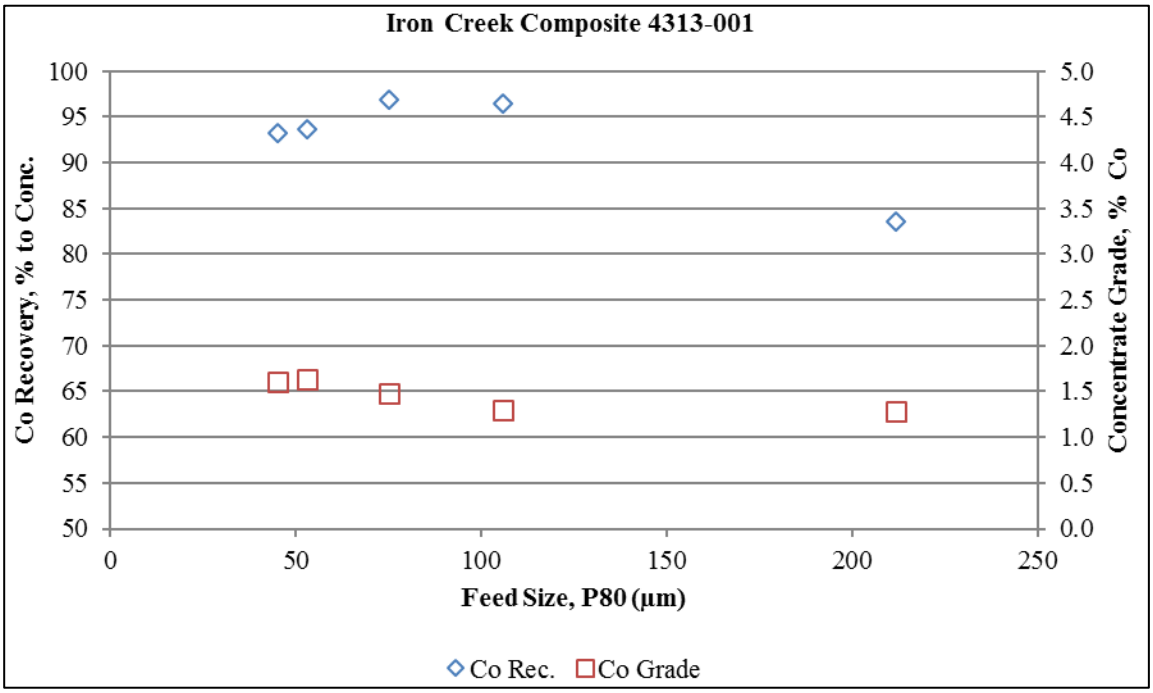



**Table 13.2 Summary of 2018 Rougher Flotation Tests**

| Sample | 4313-001 | | 4313-002 | | 4313-003 | |
|---|---|---|---|---|---|---|
| **Test No.** | F-1 | F-2 | F-3 | F-4 | F-5 | F-6 |
| **Wt. %** | | | | | | |
| **Concentrate** | 28.1 | 30.4 | 32.3 | 23.0 | 25.9 | 26.9 |
| **Tail** | 71.9 | 69.6 | 67.7 | 77.0 | 74.1 | 73.2 |
| **Cu ppm** | | | | | | |
| **Concentrate** | 30,876 | 29,093 | 30,758 | 42,871 | 4,641 | 4,498 |
| **Tail** | 621 | 385 | 206 | 164 | 170 | 88 |
| **Cu Distribution %** | | | | | | |
| **Concentrate** | 95.1 | 97.1 | 98.6 | 98.7 | 90.5 | 94.9 |
| **Tail** | 4.9 | 2.9 | 1.4 | 1.3 | 9.5 | 5.1 |
| **Co ppm** | | | | | | |
| **Concentrate** | 15,270 | 14,736 | 7,854 | 10,891 | 10,510 | 10,419 |
| **Tail** | 247 | 211 | 126 | 146 | 157 | 174 |
| **Co Distribution %** | | | | | | |
| **Concentrate** | 96.0 | 96.8 | 96.7 | 95.7 | 95.9 | 95.6 |

| Sample | 4313-001 | | 4313-002 | | 4313-003 | |
|---|---|---|---|---|---|---|
| **Test No.** | F-1 | F-2 | F-3 | F-4 | F-5 | F-6 |
| **Tail** | 4.0 | 3.2 | 3.3 | 4.3 | 4.1 | 4.4 |
| **S Distribution %** | | | | | | |
| **Concentrate** | 96.3 | 97.4 | 98.2 | 97.6 | 96.6 | 96.2 |
| **Tail** | 3.7 | 2.6 | 1.8 | 2.4 | 3.4 | 3.8 |

Copper recovery into the sulfide rougher concentrate showed somewhat more variability, averaging over 97% for the two high-grade samples but less than 93% for the lower grade sample. It does not appear that the addition of the copper sulfate had a significant impact on the flotation responses.

Following successful completion of the rougher tests, additional bulk rougher tests were conducted to produce enough sulfide concentrate to perform the cleaner flotation tests. These involved three different flotation conditions for each bulk sample: 1) Cleaning at the natural pH without regrinding, 2) Adding lime to pH 12 without regrinding, and 3) Adding lime to pH 12 with regrinding. The results from the cleaner tests are shown in Table 13.3, 13.4B and 13.4C. Except as noted, the cleaner flotation tests were conducted under the same conditions as the rougher tests.

**Table 13.3 Cleaner Test Results for Bulk Sample 4313-001**

| Test No. | F-22 | F-25 | F-28 |
|---|---|---|---|
| **Test Conditions** | **No Regrind/ Nat. pH** | **No Regrind/pH 12** | **Regrind/ pH 12** |
| **Weight %** | | | |
| **Recleaner Conc.** | 22.7 | 3.4 | 2.5 |
| **Cleaner Tail #2** | 1.9 | 4.5 | 0.8 |
| **Cleaner Tail #1** | 4.5 | 21.2 | 25.8 |
| **Rougher Tail** | 70.9 | 70.9 | 70.9 |
| **Cu Content, ppm** | | | |
| **Recleaner Conc.** | 35,600 | 117,000 | 275,000 |
| **Cleaner Tail #2** | 12,300 | 34,400 | 107,000 |
| **Cleaner Tail #1** | 6,100 | 16,700 | 4,470 |
| **Rougher Tail** | 347 | 347 | 347 |
| **Cu Distribution, %** | | | |
| **Recleaner Conc.** | 91.5 | 42.7 | 75.3 |
| **Cleaner Tail #2** | 2.6 | 16.6 | 9.4 |
| **Cleaner Tail #1** | 3.1 | 38.0 | 12.6 |
| **Rougher Tail** | 2.8 | 2.7 | 2.7 |
| **Co Content, ppm** | | | |

| Test No. | F-22 | F-25 | F-28 |
|---|---|---|---|
| Test Conditions | No Regrind/ Nat. pH | No Regrind/pH 12 | Regrind/ pH 12 |
| Recleaner Conc. | 19,500 | 15,800 | 3,400 |
| Cleaner Tail #2 | 12,600 | 19,700 | 12,800 |
| Cleaner Tail #1 | 6,610 | 16,900 | 18,100 |
| Rougher Tail | 225 | 225 | 225 |
| Co Distribution, % | | | |
| Recleaner Conc. | 86.0 | 10.4 | 1.7 |
| Cleaner Tail #2 | 4.7 | 17.2 | 2.0 |
| Cleaner Tail #1 | 5.8 | 69.4 | 93.1 |
| Rougher Tail | 3.1 | 3.0 | 3.2 |

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## Table 13.4 Cleaner Test Results for Bulk Sample 4313-002

| Test No. | F-23 | F-26 | F-29 |
|---|---|---|---|
| Test Conditions | No Regrind/ Nat. pH | No Regrind/pH 12 | Regrind/ pH 12 |
| Weight % | | | |
| Recleaner Conc. | 12.9 | 3.8 | 3.0 |
| Cleaner Tail #2 | 3.3 | 3.8 | 0.7 |
| Cleaner Tail #1 | 7.4 | 16.0 | 19.9 |
| Rougher Tail | 76.4 | 76.4 | 76.4 |
| Cu Content, ppm | | | |
| Recleaner Conc. | 60,000 | 127,000 | 303,000 |
| Cleaner Tail #2 | 40,800 | 40,500 | 55,400 |
| Cleaner Tail #1 | 15,900 | 24,100 | 4,900 |
| Rougher Tail | 253 | 253 | 253 |
| Cu Distribution, % | | | |
| Recleaner Conc. | 74.0 | 46.3 | 85.4 |
| Cleaner Tail #2 | 12.9 | 14.8 | 3.6 |
| Cleaner Tail #1 | 11.3 | 37.0 | 9.2 |
| Rougher Tail | 1.8 | 1.9 | 1.8 |
| Co Content, ppm | | | |
| Recleaner Conc. | 15,700 | 12,900 | 2,180 |
| Cleaner Tail #2 | 13,000 | 16,000 | 13,000 |

| Test No. | F-23 | F-26 | F-29 |
|---|---|---|---|
| Test Conditions | No Regrind/ Nat. pH | No Regrind/pH 12 | Regrind/ pH 12 |
| Cleaner Tail #1 | 5,100 | 11,900 | 14,500 |
| Rougher Tail | 190 | 190 | 190 |
| Co Distribution, % | | | |
| Recleaner Conc. | 68.0 | 15.6 | 2.1 |
| Cleaner Tail #2 | 14.4 | 19.3 | 2.9 |
| Cleaner Tail #1 | 12.7 | 60.5 | 90.5 |
| Rougher Tail | 4.9 | 4.6 | 4.6 |

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**Table 13.5 Cleaner Test Results for Bulk Sample 4313-003**

| Test No. | F-24 | F-27 | F-30 |
|---|---|---|---|
| Test Conditions | No Regrind/ Nat. pH | No Regrind/pH 12 | Regrind/ pH 12 |
| Weight % | | | |
| Recleaner Conc. | 12.0 | 1.6 | 0.5 |
| Cleaner Tail #2 | 4.8 | 1.3 | 1.3 |
| Cleaner Tail #1 | 8.7 | 22.6 | 23.7 |
| Rougher Tail | 74.5 | 74.5 | 74.5 |
| Cu Content, ppm | | | |
| Recleaner Conc. | 7,700 | 62,800 | 107,000 |
| Cleaner Tail #2 | 5,200 | 10,400 | 29,700 |
| Cleaner Tail #1 | 2,060 | 1,000 | 1,200 |
| Rougher Tail | 142 | 142 | 142 |
| Cu Distribution, % | | | |
| Recleaner Conc. | 63.3 | 68.3 | 40.8 |
| Cleaner Tail #2 | 17.1 | 9.2 | 29.4 |
| Cleaner Tail #1 | 12.3 | 15.3 | 21.7 |
| Rougher Tail | 7.3 | 7.2 | 8.1 |
| Co Content, ppm | | | |
| Recleaner Conc. | 15,700 | 13,200 | 7,190 |
| Cleaner Tail #2 | 15,000 | 15,300 | 10,200 |
| Cleaner Tail #1 | 6,240 | 13,200 | 12,600 |
| Rougher Tail | 190 | 190 | 190 |

| Test No. | F-24 | F-27 | F-30 |
|---|---|---|---|
| Test Conditions | No Regrind/ Nat. pH | No Regrind/pH 12 | Regrind/ pH 12 |
| Co Distribution, % | | | |
| Recleaner Conc. | 57.4 | 6.0 | 1.1 |
| Cleaner Tail #2 | 22.0 | 5.6 | 4.0 |
| Cleaner Tail #1 | 16.6 | 84.6 | 90.8 |
| Rougher Tail | 4.0 | 3.8 | 4.0 |

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Overall the fine regrind followed by flotation at pH 12 gave the best results. For the two higher-grade samples, copper recovery ranged from 75 to 85% and the resulting cleaner concentrates varied from 27.5 to 30.0% copper. In this grade range the concentrate should be readily accepted as smelter feed. Since most of the arsenic appears to associate with the pyrite, no impurities are expected to reach smelter penalty levels.

Bulk sample 003 had a much lower copper head grade and did not respond as well as the others when the pH was raised and the sample was reground. Under these conditions the recleaner concentrate contained only about 40% of the copper at a grade below that required for smelting. Over 20% of the copper also reported to the pyrite concentrate, along with the cobalt. Thus, this material will require further optimization to produce an acceptable flotation response.

The cleaner tail #1 represents the pyrite that was depressed by increasing the pH to 12. For all three bulk samples this product contains more than 90% of the cobalt at grades of 1.2 to 1.8%. Higher grades may be difficult to achieve, as most of the cobalt appears to substitute for iron in the pyrite crystal structure. Mineralogical studies are now underway to confirm this.

It is worth noting that the current flotation results parallel those obtained in the earlier studies done by Hanna/Coastal. Both programs produced acceptable copper concentrates and showed that the cobalt generally reported with the pyrite. However, the cobalt grade was generally low.

The fact that the cobalt content of the pyrite probably will not exceed 2 to 4% will likely prohibit shipment of the material to a remote site for processing. At this point, no treatment methods have been tested for processing the cobalt-bearing pyrite concentrate. However, two process approaches have been identified, which appear to be technically viable for on-site production of a cobalt product. One is to oxidize the pyrite concentrate in a roaster. The other is to use an autoclave to oxidize the concentrate.

The roasting approach, probably using a fluid bed roaster, will provide a controlled oxidation of the pyrite. This will produce a calcine containing iron oxide and cobalt oxides or sulfate. The calcine would then be leached with acid to solubilize the cobalt, leaving the more refractory iron oxide as a solid inert residue for disposal. The leach solution would then be processed and the cobalt removed using solvent extraction ("SX"). The cobalt-rich organic phase in the SX circuit can then be processed to recover the cobalt by either electrowinning to produce metallic cobalt, or precipitating a salt-like cobalt carbonate. If there is any residual copper in the pyrite concentrate it will also be solubilized in the leach and can be separated from the cobalt using differential solvent extraction.

During the roasting step the sulfur in the pyrite would be oxidized to form gaseous sulfur dioxide. The $SO_2$-bearing gas stream can be sent to an acid plant to produce 98% sulfuric acid. This would be a salable commodity if there is a demand for acid in the area. Any arsenic contained in the pyrite concentrate will also be volatilized and will have to be condensed or scrubbed from the gas stream ahead of the acid plant.

The autoclave would oxidize the pyrite, including the cobalt, and precipitate the resulting iron in a single step. The cobalt would remain in solution and then be concentrated using SX after the solution has been clarified. The remaining cobalt recovery steps would be the same as described for roasting. One problem with autoclaving is that the precipitated iron product will be an acidic sludge and will require impoundment in an environmentally acceptable manner. In addition, the remaining barren autoclave solution will be a low-grade acid and will require treatment. Any sludge formed by this treatment would also require suitable impoundment.

## 13.3 Summary

First Cobalt's metallurgical testing has been limited to work on two bulk samples obtained from adjacent spots in Adit-1 and one bulk sample from a single location in Adit-2. It is not clear how closely they represent the average life-of-mine cobalt and copper levels. However, both the cobalt and copper levels in the samples do fall within the expected grade ranges, so are representative in that sense.

All three samples responded very well when subjected to rougher flotation using standard conditions at the natural pH of 6 to 8. More than 96% of the sulfide sulfur reported to the bulk concentrate and cobalt recovery also averaged over 96%. Copper recovery into the bulk concentrate averaged over 97% for the two high-grade samples and 92.5% for the low grade sample.

An initial round of cleaner flotation tests was performed on the sulfide rougher concentrates. Optimum performance was achieved by regrinding the rougher concentrate and floating at pH 12 to depress the pyrite. For the two high-grade copper samples, 75% to 85% of the copper was recovered into copper concentrates that would be suitable for conventional copper smelting. The low grade copper sample appears to need some further flotation optimization in order to produce acceptable smelter feed.

The cobalt was recovered in the pyrite product that represents the cleaner flotation tailings. For all three bulk samples this product contained more than 90% of the cobalt at grades of 1.2% to 1.8% Co. Higher grades may be difficult to obtain, as the cobalt appears to be bound up within the pyrite crystal structure.

No testwork has yet been done on recovery of the cobalt from the pyrite concentrates. However, two approaches appear to be technically viable. One is to roast the concentrate, then leach the cobalt from the resulting cinder and concentrate the cobalt using solvent extraction. Final recovery of the cobalt would be as a salt or electrowon metal. The other approach is to use an autoclave to oxidize the pyrite and solubilize the cobalt, then use solvent extraction.

# 14.0 MINERAL RESOURCE ESTIMATES (ITEM 14)

## 14.1 Introduction

The mineral resource estimation for the Iron Creek project was completed in accordance with the guidelines of Canadian National Instrument 43-101 ("NI 43-101"). The modeling and estimation of the mineral resources were completed on September 14, 2018 under the supervision of Mr. Steven J. Ristorcelli, a qualified person with respect to mineral resource estimations under NI 43-101. The effective date of the resource estimate is September 14, 2018 and is based on data derived from drilling completed in 2018 through drill hole IC18-24, but excluding holes IC18-21 and IC18-22. The drilling data was first received in March 2018 and the final results were received from First Cobalt on August 27, 2018.

Mr. Ristorcelli is independent of First Cobalt by the definitions and criteria set forth in NI 43-101; there is no affiliation between Mr. Ristorcelli and First Cobalt except that of independent consultant/client relationships. Mr. Ristorcelli is not aware of any unusual environmental, permitting, legal, title, taxation, socio-economic, marketing, or political factors that may materially affect the Iron Creek project mineral resources as of the date of this report.

The Iron Creek project mineral resources are classified in order of increasing geological and quantitative confidence into Inferred, Indicated, and Measured categories in accordance with the "CIM Definition Standards - For Mineral Resources and Mineral Reserves" (2014) and therefore NI 43-101. CIM mineral resource definitions are given below, with CIM's explanatory text shown in italics:

> **Mineral Resource**
>
> *Mineral Resources are sub-divided, in order of increasing geological confidence, into Inferred, Indicated and Measured categories. An Inferred Mineral Resource has a lower level of confidence than that applied to an Indicated Mineral Resource. An Indicated Mineral Resource has a higher level of confidence than an Inferred Mineral Resource but has a lower level of confidence than a Measured Mineral Resource.*
>
> A Mineral Resource is a concentration or occurrence of solid material of economic interest in or on the Earth's crust in such form, grade or quality and quantity that there are reasonable prospects for eventual economic extraction.
>
> The location, quantity, grade or quality, continuity and other geological characteristics of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge, including sampling.
>
> *Material of economic interest refers to diamonds, natural solid inorganic material, or natural solid fossilized organic material including base and precious metals, coal, and industrial minerals.*
>
> *The term Mineral Resource covers mineralization and natural material of intrinsic economic interest which has been identified and estimated through exploration and*

*sampling and within which Mineral Reserves may subsequently be defined by the consideration and application of Modifying Factors. The phrase 'reasonable prospects for eventual economic extraction' implies a judgment by the Qualified Person in respect of the technical and economic factors likely to influence the prospect of economic extraction. The Qualified Person should consider and clearly state the basis for determining that the material has reasonable prospects for eventual economic extraction. Assumptions should include estimates of cutoff grade and geological continuity at the selected cut-off, metallurgical recovery, smelter payments, commodity price or product value, mining and processing method and mining, processing and general and administrative costs. The Qualified Person should state if the assessment is based on any direct evidence and testing.*

*Interpretation of the word 'eventual' in this context may vary depending on the commodity or mineral involved. For example, for some coal, iron, potash deposits and other bulk minerals or commodities, it may be reasonable to envisage 'eventual economic extraction' as covering time periods in excess of 50 years. However, for many gold deposits, application of the concept would normally be restricted to perhaps 10 to 15 years, and frequently to much shorter periods of time.*

**Inferred Mineral Resource**

An Inferred Mineral Resource is that part of a Mineral Resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade or quality continuity.

An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.

*An Inferred Mineral Resource is based on limited information and sampling gathered through appropriate sampling techniques from locations such as outcrops, trenches, pits, workings and drill holes. Inferred Mineral Resources must not be included in the economic analysis, production schedules, or estimated mine life in publicly disclosed Pre-Feasibility or Feasibility Studies, or in the Life of Mine plans and cash flow models of developed mines. Inferred Mineral Resources can only be used in economic studies as provided under NI 43-101.*

*There may be circumstances, where appropriate sampling, testing, and other measurements are sufficient to demonstrate data integrity, geological and grade/quality continuity of a Measured or Indicated Mineral Resource, however, quality assurance and quality control, or other information may not meet all industry norms for the disclosure of an Indicated or Measured Mineral Resource. Under these circumstances, it may be reasonable for the Qualified Person to report an Inferred Mineral Resource if the*

*Qualified Person has taken steps to verify the information meets the requirements of an Inferred Mineral Resource.*

**Indicated Mineral Resource**

An Indicated Mineral Resource is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics are estimated with sufficient confidence to allow the application of Modifying Factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit.

Geological evidence is derived from adequately detailed and reliable exploration, sampling and testing and is sufficient to assume geological and grade or quality continuity between points of observation.

An Indicated Mineral Resource has a lower level of confidence than that applying to a Measured Mineral Resource and may only be converted to a Probable Mineral Reserve.

*Mineralization may be classified as an Indicated Mineral Resource by the Qualified Person when the nature, quality, quantity and distribution of data are such as to allow confident interpretation of the geological framework and to reasonably assume the continuity of mineralization. The Qualified Person must recognize the importance of the Indicated Mineral Resource category to the advancement of the feasibility of the project. An Indicated Mineral Resource estimate is of sufficient quality to support a Pre-Feasibility Study which can serve as the basis for major development decisions.*

**Measured Mineral Resource**

A Measured Mineral Resource is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics are estimated with confidence sufficient to allow the application of Modifying Factors to support detailed mine planning and final evaluation of the economic viability of the deposit.

Geological evidence is derived from detailed and reliable exploration, sampling and testing and is sufficient to confirm geological and grade or quality continuity between points of observation.

A Measured Mineral Resource has a higher level of confidence than that applying to either an Indicated Mineral Resource or an Inferred Mineral Resource. It may be converted to a Proven Mineral Reserve or to a Probable Mineral Reserve.

*Mineralization or other natural material of economic interest may be classified as a Measured Mineral Resource by the Qualified Person when the nature, quality, quantity and distribution of data are such that the tonnage and grade or quality of the mineralization can be estimated to within close limits and that variation from the estimate would not significantly affect potential economic viability of the deposit. This*

*category requires a high level of confidence in, and understanding of, the geology and controls of the mineral deposit.*

Mr. Ristorcelli reports resources at cutoffs that are reasonable for deposits of this nature given anticipated mining methods and plant processing costs, while also considering economic conditions, because of the regulatory requirements that a resource exists "in such form and quantity and of such a grade or quality that it has reasonable prospects for eventual economic extraction."

The resource block model is rotated 20° clockwise and the blocks are 5ft northeast across strike, by 10ft vertical, by 10ft east-southeast. Cobalt and copper resources are reported based on cobalt-equivalent cutoff grades.

## 14.2 Database

Mr. Ristorcelli considers the drilling in two categories: historical drilling and First Cobalt drilling. The historical drill data are not used in modeling or estimation because the historical source data is rare to non-existent, and because many assumptions had to be made when compiling the historical data. Qualitatively, the historical drilling has intersected widths and grades of mineralization in generally similar locations as to what has been intersected with First Cobalt's drilling. However, explicit modeling in detail shows enough differences to exclude that historical drilling. If additional supporting information, particularly survey data, is found, those historical data may be able to be used. Consequently, all statistics and all descriptions and discussions that follow are based solely on First Cobalt's drilling. First Cobalt also sampled underground in the exploration adits. Those samples are in the database and were used for modeling metal domains, but were not used in estimation.

The Iron Creek resource database – First Cobalt data only – has 86 drill holes (all core) with 66,649ft of drilling. Assays were complete for 62 of these holes as of the effective date of the resource estimate. All drill holes core. There are also 670ft of underground adit samples. Table 14.1 presents descriptive statistics for the First Cobalt data in the Iron Creek database that was audited and imported into MineSight by MDA. The database contains 10,740 assay records, all of which were deemed usable in modeling metal domains and density (Table 14.1), but only those used in estimation are described later in this section.

**Table 14.1 Descriptive Statistics - Resource Drill-Hole Database**
(accepted sample data only)

| Drill and Underground-Sample Data | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Valid | Median | Mean | Std Dev | CV | Min | Max | Units |
| Length | 10,740 | 4.5 | 4.036 | | | 0.5 | 9.2 | ft |
| Co | 10,740 | 0.018 | 0.061 | 0.118 | 1.928 | 0.000 | 1.590 | % |
| Cu | 10,740 | 0.011 | 0.154 | 0.518 | 3.377 | 0.000 | 14.705 | % |
| Core Rec. | 7,321 | 100 | 99 | 7 | 0 | 12.5 | 166.67 | % |
| RQD | 7,277 | 50 | 50 | 27 | 1 | 0 | 113.47 | % |
| As | 10,536 | 13 | 86 | 191 | 2 | 0.2 | 3641.2 | ppm |
| Fe | 10,740 | 6.62 | 7.26 | 3.38 | 0.47 | 0.413 | 35 | % |
| S | 10,740 | 0.56 | 1.47 | 2.21 | 1.50 | 0.001 | 21.28 | % |
| Density | 360 | 2.79 | 2.83 | 0.16 | 0.06 | 2.444 | 4.153 | g/cm3 |

*Core recovery and RQD data were neither audited nor corrected

Logged core recovery and RQD were loaded into the database but were not audited. A few impossible recovery and RQD values >100% exist, as noted in Table 14.1. The database also contains logged geologic features, of which rock types, pyrite, chalcopyrite, arsenopyrite, pyrrhotite, covellite, magnetite, iron oxide, copper oxide, native copper, chlorite, sulfides were imported and at least reviewed.

The average drill spacing is presently slightly less than 100ft within the mineralized zones, but because of fan-drilling and hole locations collared in or near mineralization in underground drifts, this is not a meaningful average. The standard deviation of the drill spacing is half of the average drill spacing demonstrating that the average is misleading.

## 14.3 Models

First Cobalt built interpretations for faults, quartzite beds, mineralized trends, and some bedding structure. MDA used these to guide the explicit modeling of cobalt and copper domains on cross-sections oriented N20$^{o}$E, looking northwest and spaced 100ft apart. Importantly, preliminary metal-domain modeling began in the second quarter of 2018 to broadly understand the shape and tenor of the mineralization. In July 2018, domain modeling was done more rigorously for the resource estimate. It was then decided that more of the ongoing drilling data should be incorporated, so the resource database was updated with newly-received assays and additional domain modeling was done. This provided insight into the reliability of the domain modeling and also into the predictability of the deposit (see Section 14.8).

The host rock is a relatively homogenous sequence of argillite and finely interbedded quartzite that presently lacks recognized marker units. Therefore, the metal domains were explicitly constructed using quartzite beds guiding orientations along with interpreted bedding features. Though rare, the diabase dikes are easily recognized. When weakly or unmineralized samples coincided with logged diabase

dikes, these areas were explicitly excluded from the modeled metal domains. Alluvial cover is minimal to non-existent and was not modeled.

Core photos were reviewed and used for metal-domain interpretations. Cobalt and copper domains were defined based on population breaks on cumulative probability plots. After sectional interpretations were completed, the cobalt and copper domains were snapped to the drill holes and sliced for modeling on horizontal plans at 20ft spacing.

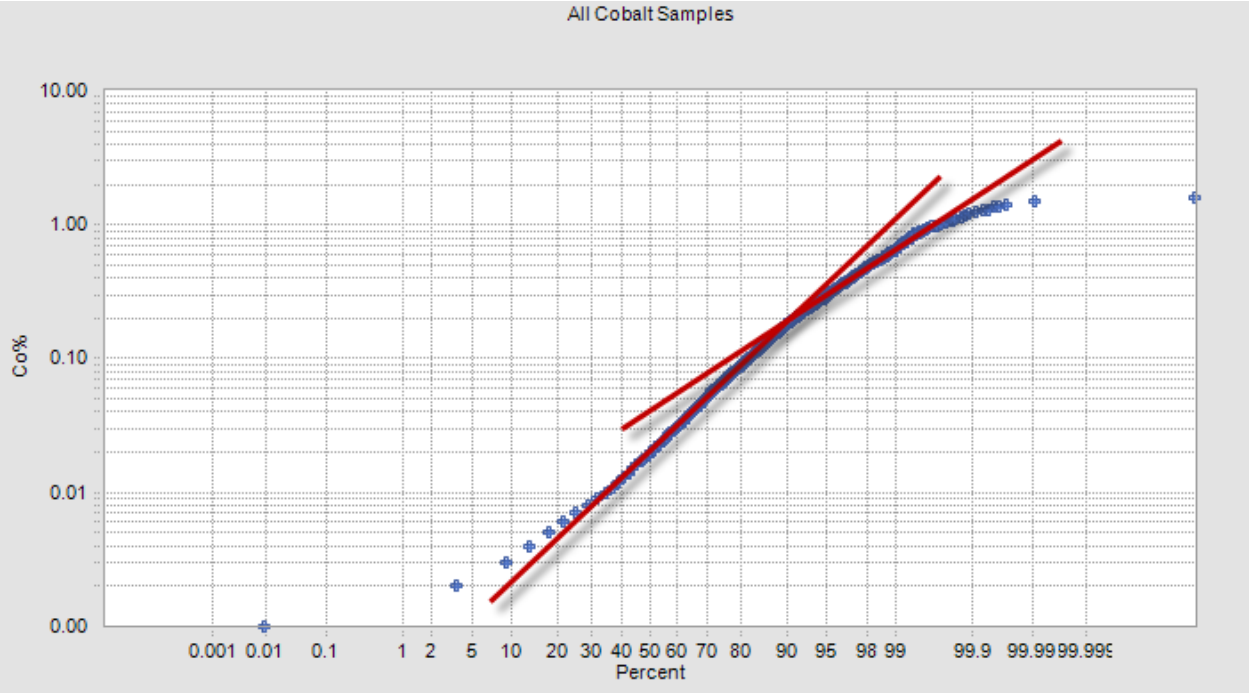
### 14.3.1 Cobalt Model

Two cobalt domains with the following characteristics were defined based on cumulative probability plots ("CPPs"; Figure 14.1):

- Greater than ~0.015% Co: low-grade domain, trace to one percent finely disseminated pyrite.
- Greater than ~0.15% Co: mid-grade domain, abundant disseminated pyrite to massive lenses of very fine-grained pyrite, to blebs and massive replacements of medium- to coarse-grained, light-colored subhedral pyrite. Samples with grades greater than 1% Co have massive pryite and/or chalcopyrite occurring in about half of the sample.

Descriptive statistics are presented in Table 14.2.

**Figure 14.1 Cumulative Probability Plot of Cobalt Assays**



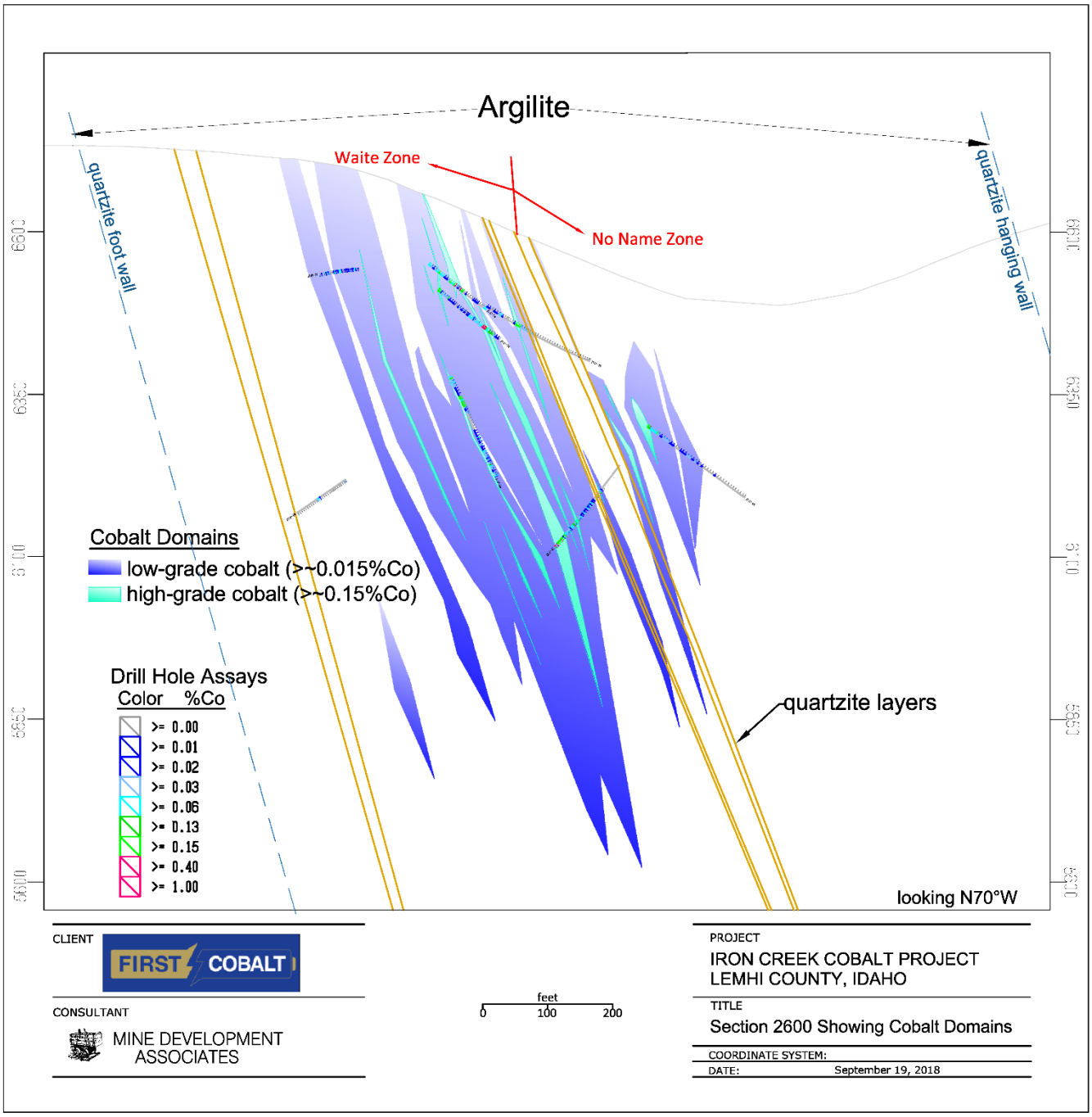

The cobalt mineralization largely occurs parallel to layering and is generally stratabound, if not at least in part stratiform (Section 8.0). A representative cross section is given in Figure 14.2. Overall the

continuity seems to be grossly predictable. Correlating the thinner intervals from hole to hole is tenuous because of the lack of any unique characteristic. This is the principal reason that the entire resource is classified as Inferred.

**Table 14.2 Descriptive Statistics by Cobalt Domain**

| Low-grade cobalt domain | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **Valid** | **Median** | **Mean** | **Std Dev** | **CV** | **Min** | **Max** | **Units** |
| Length | 4,187 | 4.5 | 4.043 | | | 0.5 | 8.7 | ft |
| **Co** | **4,187** | **0.035** | **0.048** | **0.042** | **0.884** | **0.003** | **1.000** | **%** |
| **Capped Co** | **4,187** | **0.035** | **0.047** | **0.038** | **0.806** | **0.003** | **0.400** | **%** |
| Cu | 4,187 | 0.009 | 0.124 | 0.447 | 3.613 | 0.000 | 10.246 | % |
| Core Rec. | 3,056 | 100 | 99 | 6 | 0 | 14 | 166.67 | % |
| RQD | 3,023 | 54 | 52 | 27 | 1 | 0 | 113.47 | % |
| As | 4,127 | 27 | 54 | 95 | 2 | 0.4 | 1908 | ppm |
| Fe | 4,187 | 7.01 | 7.30 | 2.21 | 0.30 | 1.599 | 35 | % |
| S | 4,187 | 0.97 | 1.28 | 1.10 | 0.86 | 0.025 | 10 | % |
| Density | 164 | 2.81 | 2.82 | 0.07 | 0.03 | 2.505 | 3.163 | g/cm3 |
| **High-grade cobalt domain** | | | | | | | | |
| | **Valid** | **Median** | **Mean** | **Std Dev** | **CV** | **Min** | **Max** | **Units** |
| Length | 1,640 | 3.7 | 3.625 | | | 1 | 9.2 | ft |
| **Co** | **1,640** | **0.206** | **0.261** | **0.195** | **0.750** | **0.013** | **1.590** | **%** |
| **Capped Co** | **1,640** | **0.206** | **0.261** | **0.195** | **0.750** | **0.013** | **1.590** | **%** |
| Cu | 1,640 | 0.023 | 0.245 | 0.796 | 3.257 | 0.000 | 14.705 | % |
| Core Rec. | 1,177 | 100 | 99 | 5 | 0 | 40 | 151.28 | % |
| RQD | 1,166 | 58 | 56 | 25 | 0 | 0 | 100 | % |
| As | 1,594 | 293 | 376 | 328 | 1 | 4.1 | 3641.2 | ppm |
| Fe | 1,640 | 10.55 | 11.79 | 5.06 | 0.43 | 4.273 | 35 | % |
| S | 1,640 | 4.95 | 5.44 | 2.65 | 0.49 | 0.243 | 10 | % |
| Density | 70 | 2.90 | 2.98 | 0.27 | 0.09 | 2.772 | 4.153 | g/cm3 |
| **Outside cobalt domains** | | | | | | | | |
| | **Valid** | **Median** | **Mean** | **Std Dev** | **CV** | **Min** | **Max** | **Units** |
| Length | 4,780 | 4.8 | 4.144 | | | 0.5 | 8.4 | ft |
| **Co** | **4,780** | **0.006** | **0.008** | **0.015** | **1.864** | **0.000** | **0.962** | **%** |
| **Capped Co** | **4,780** | **0.006** | **0.008** | **0.012** | **1.496** | **0.000** | **0.200** | **%** |
| Cu | 4,780 | 0.010 | 0.138 | 0.463 | 3.358 | 0.000 | 13.104 | % |
| Core Rec. | 3,088 | 100 | 98 | 8 | 0 | 12.5 | 150 | % |
| RQD | 3,088 | 45 | 45 | 27 | 1 | 0 | 111.77 | % |
| As | 4,682 | 4 | 22 | 88 | 4 | 0.2 | 2614.9 | ppm |
| Fe | 4,780 | 5.39 | 5.81 | 2.12 | 0.36 | 0.413 | 24.425 | % |
| S | 4,780 | 0.13 | 0.33 | 0.64 | 1.95 | 0.001 | 10 | % |
| Density | 126 | 2.76 | 2.75 | 0.06 | 0.02 | 2.444 | 2.901 | g/cm3 |

**Figure 14.2 Iron Creek Cobalt Domains– Section 2600**



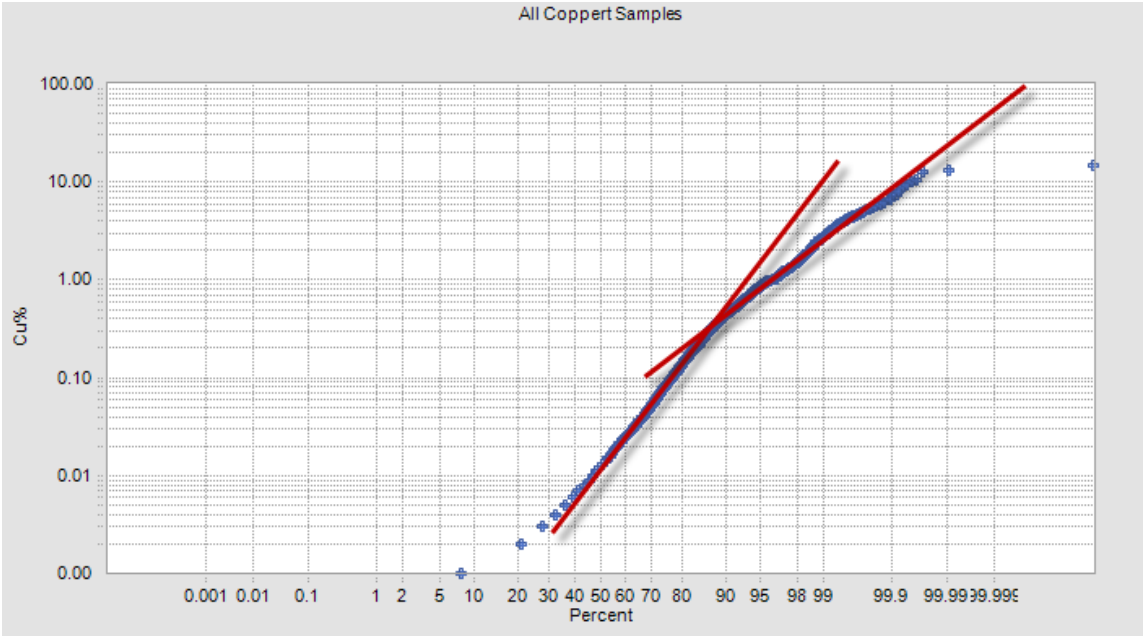
### 14.3.2 Copper Model

The geologic model guided the explicitly modeled copper domains. Two copper domains with the following characteristics were defined based on population breaks on cumulative probability plots (Figure 14.3):

- Greater than ~0.05% Cu: low-grade domain, chalcopyrite in blebs, often irregular and somewhat fracture-controlled.
- Greater than ~0.35% Cu: mid-grade domain, chalcopyrite in abundant blebs and some disseminated, locally massive replacements of medium- to coarse-grained chalcopyrite. The highest grades in the mid-grade domain are not continuous at current drill spacing and are greater than 5% Cu; these would be massive sulfides occurring as 50% of the sample.

Descriptive statistics are presented in Table 14.3.

**Figure 14.3 Cumulative Probability Plot of Copper Assays**

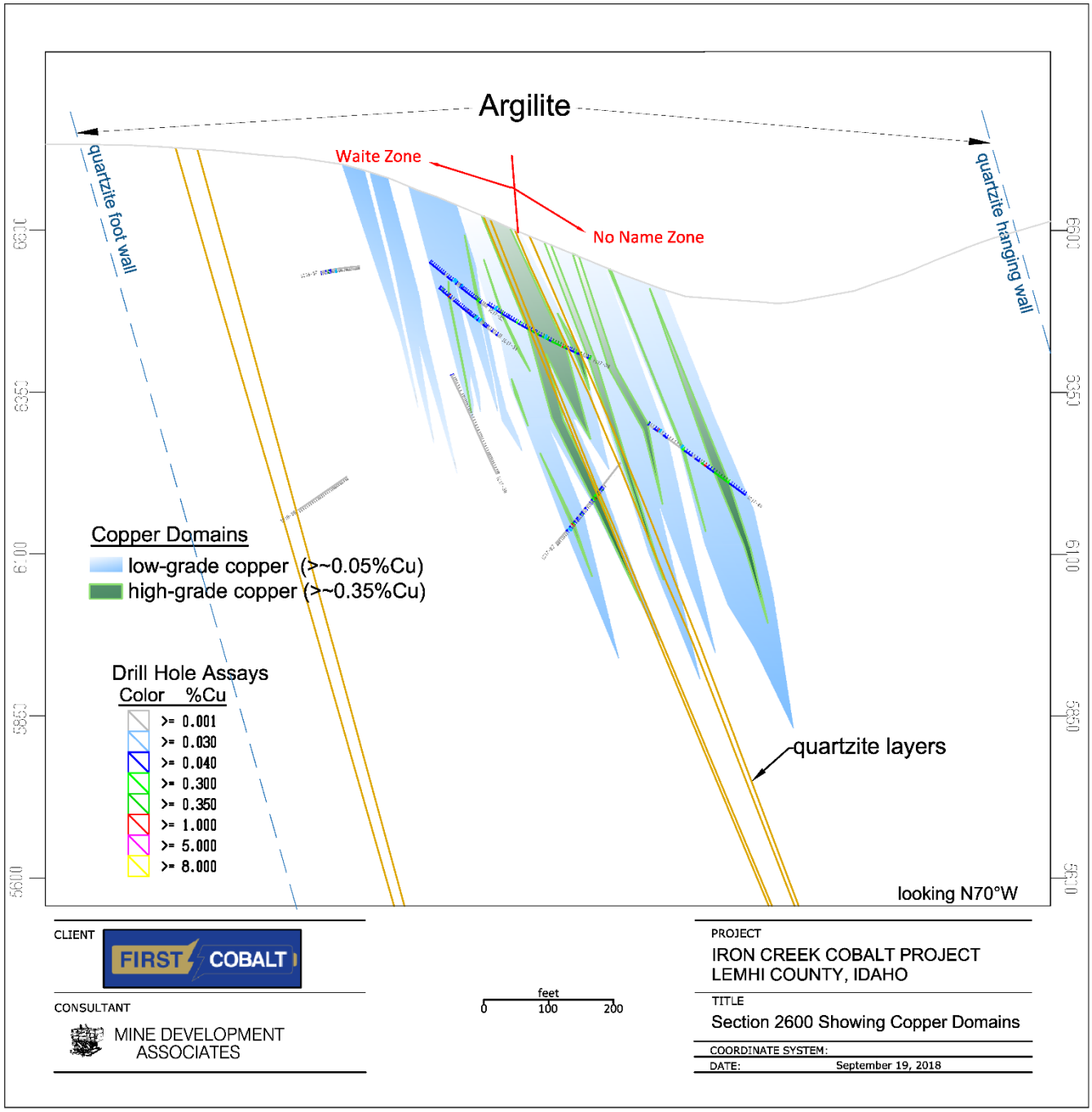



Like the cobalt mineralization, the copper mineralization mostly occurs parallel to presumed bedding and is generally stratabound. A representative cross section is given in Figure 14.4 . Overall the continuity is grossly predictable but correlating the thinner intervals from hole to hole is tenuous, in part because there are no unique characteristics. This is the principal reason that the entire resource is classified as Inferred.

## Table 14.3 Descriptive Statistics by Copper Domain

| Low-grade copper domain | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **Valid** | **Median** | **Mean** | **Std Dev** | **CV** | **Min** | **Max** | **Units** |
| Length | 2,232 | 4.4 | 3.984 | | | 1 | 5.5 | ft |
| **Cu** | **2,232** | **0.078** | **0.130** | **0.235** | **1.801** | **0.002** | **6.695** | **%** |
| **Capped Cu** | **2,232** | **0.078** | **0.127** | **0.177** | **1.398** | **0.002** | **2.000** | **%** |
| Co | 2,232 | 0.020 | 0.070 | 0.130 | 1.864 | 0.001 | 1.590 | % |
| Core Rec. | 1,588 | 100 | 98 | 7 | 0 | 14 | 166.667 | % |
| RQD | 1,582 | 51 | 49 | 28 | 1 | 0 | 106 | % |
| As | 2,177 | 14 | 90 | 193 | 2 | 0.2 | 1873.6 | ppm |
| Fe | 2,232 | 6.95 | 7.60 | 3.26 | 0.43 | 2.215 | 35 | % |
| S | 2,232 | 0.60 | 1.57 | 2.23 | 1.42 | 0.004 | 10 | % |
| Density | 71 | 2.80 | 2.83 | 0.21 | 0.07 | 2.444 | 4.153 | g/cm3 |
| **High-grade copper domain** | | | | | | | | |
| | **Valid** | **Median** | **Mean** | **Std Dev** | **CV** | **Min** | **Max** | **Units** |
| Length | 1,531 | 4.3 | 3.904 | | | 1 | 6.8 | ft |
| **Cu** | **1,531** | **0.537** | **0.855** | **1.119** | **1.310** | **0.002** | **14.705** | **%** |
| **Capped Cu** | **1,531** | **0.537** | **0.843** | **1.017** | **1.206** | **0.002** | **8.000** | **%** |
| Co | 1,531 | 0.026 | 0.089 | 0.151 | 1.701 | 0.001 | 1.415 | % |
| Core Rec. | 941 | 100 | 98 | 9 | 0 | 12.5 | 151.282 | % |
| RQD | 937 | 52 | 50 | 28 | 1 | 0 | 100 | % |
| As | 1,516 | 14 | 121 | 247 | 2 | 0.3 | 3641.2 | ppm |
| Fe | 1,531 | 8.14 | 8.78 | 3.25 | 0.37 | 2.471 | 35 | % |
| S | 1,531 | 1.43 | 2.60 | 2.89 | 1.11 | 0.008 | 21.28 | % |
| Density | 48 | 2.82 | 2.88 | 0.16 | 0.05 | 2.748 | 3.692 | g/cm3 |
| **Outside copper domains** | | | | | | | | |
| | **Valid** | **Median** | **Mean** | **Std Dev** | **CV** | **Min** | **Max** | **Units** |
| Length | 6,977 | 4.6 | 4.082 | | | 0.5 | 9.2 | ft |
| **Cu** | **6,977** | **0.003** | **0.014** | **0.079** | **5.780** | **0.000** | **3.357** | **%** |
| **Capped Cu** | **6,977** | **0.003** | **0.008** | **0.011** | **1.299** | **0.000** | **0.040** | **%** |
| Co | 6,977 | 0.016 | 0.053 | 0.104 | 1.976 | 0.000 | 1.517 | % |
| Core Rec. | 4,792 | 100 | 99 | 6 | 0 | 28 | 150 | % |
| RQD | 4,758 | 50 | 49 | 27 | 1 | 0 | 113.47 | % |
| As | 6,843 | 13 | 78 | 175 | 2 | 0.2 | 3475 | ppm |
| Fe | 6,977 | 6.15 | 6.83 | 3.35 | 0.49 | 0.413 | 35 | % |
| S | 6,977 | 0.40 | 1.20 | 1.94 | 1.61 | 0.001 | 10 | % |
| Density | 241 | 2.79 | 2.81 | 0.13 | 0.05 | 2.624 | 4.093 | g/cm3 |

**Figure 14.4 Iron Creek Copper Domains– Section 2600**



Cobalt and copper are individually zoned and occur in part separately and in part overlapping. Figure 14.5 shows the distributions of cobalt and copper in three dimensions. Figure 14.6 presents the copper and cobalt domains as interpreted and explicitly modeled. Cobalt dominates in the eastern part of the No Name zone and deeper in the western portion of the Waite Zone. In general, the best and most pervasive copper grades occur in the No Name zone to the west, but copper is also relatively strongly mineralized in the Waite zone to the west and near surface. Throughout the Iron Creek mineralized zones, copper grade correlates with silver (~3.5g Ag/t) and cobalt correlates with arsenic (~300ppm in the high-grade cobalt domain). Presently, the cause and controls of the cobalt and copper zoning are poorly understood.

**Figure 14.5 Perspective View of Iron Creek Cobalt and Copper Grade Shells**
(looking roughly north at -50º; red are copper grades >1%; blue are cobalt grades >0.1%;
thick black lines are underground adits; thin black lines are First Cobalt drill holes)

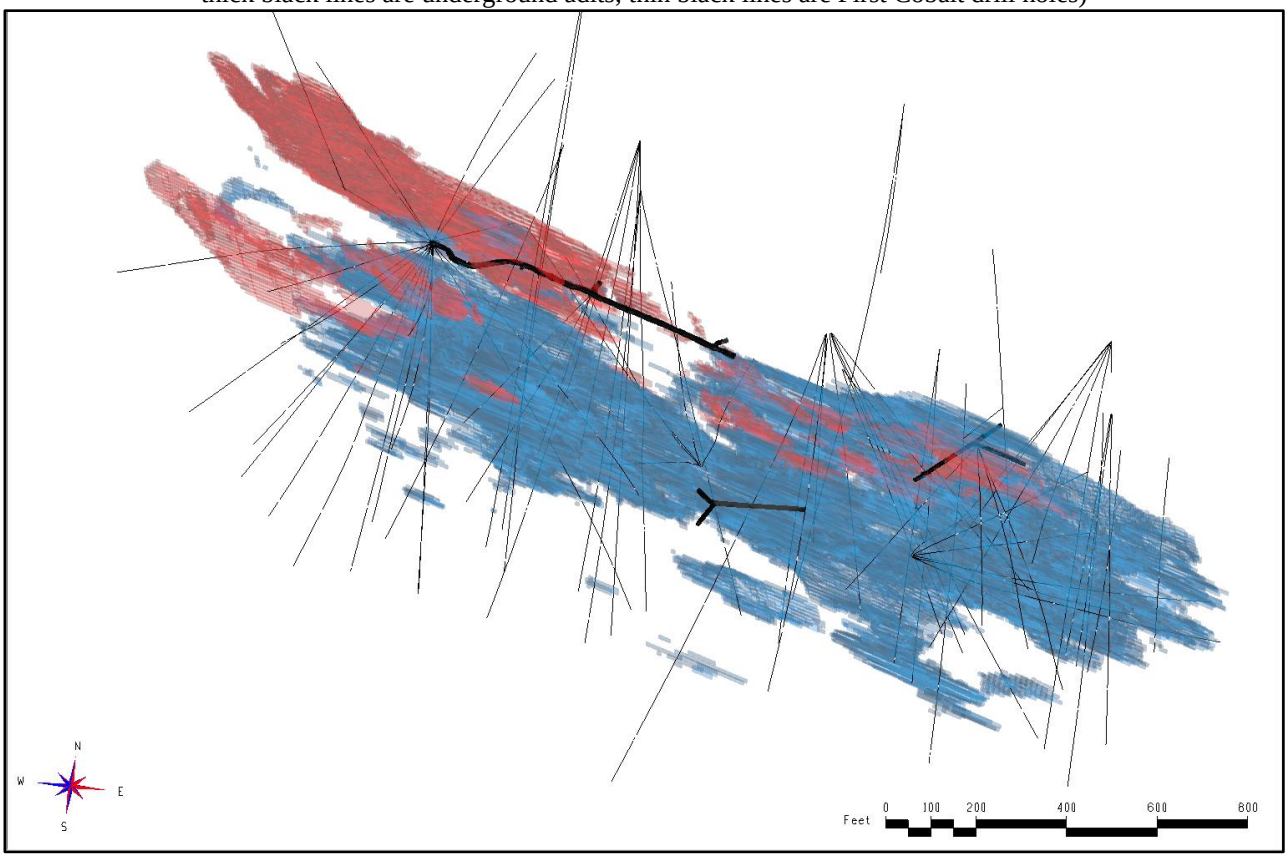
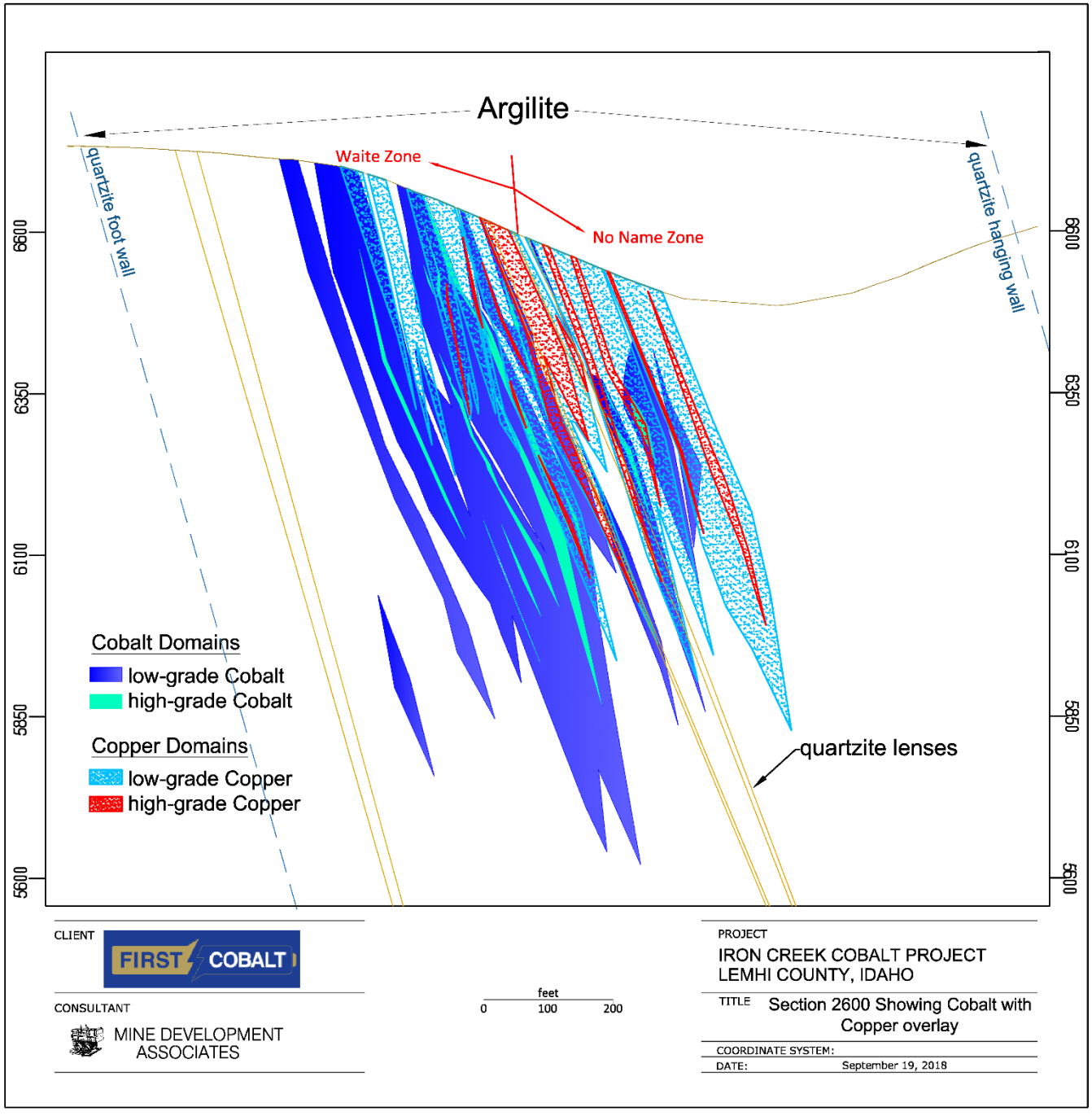


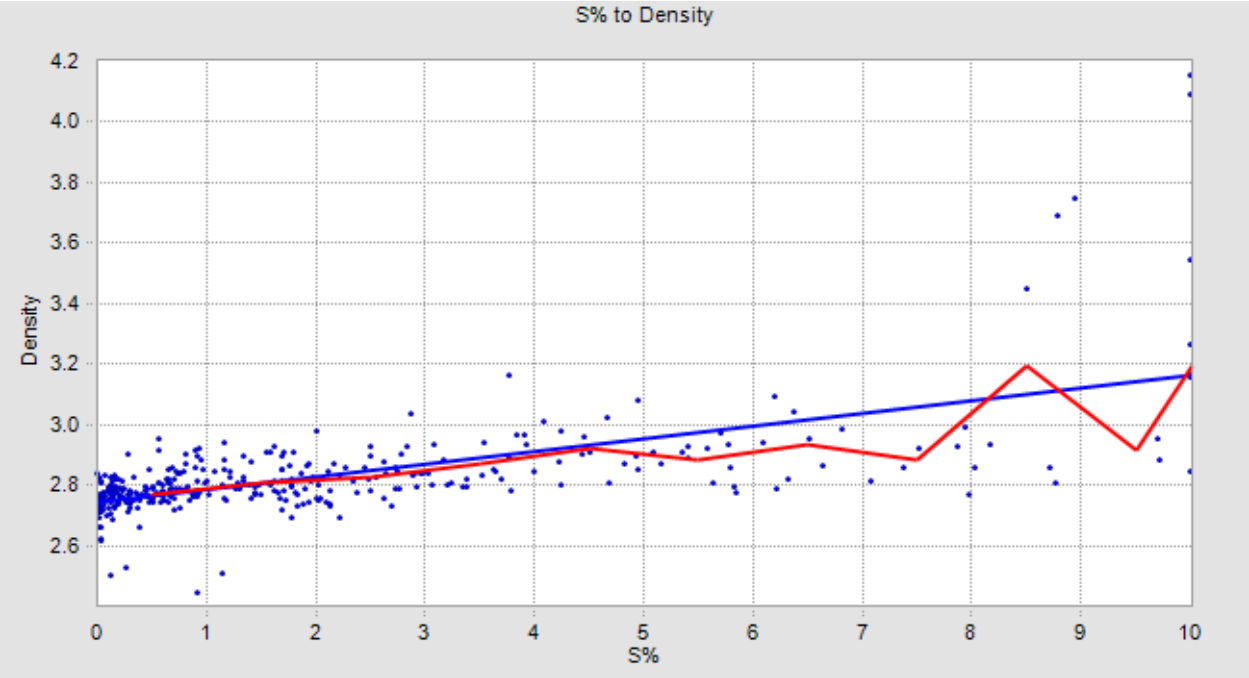
**Figure 14.6 Iron Creek Cobalt and Copper Domains– Section 2600**



## 14.4 Density

There are 460 density measurements in the Iron Creek resource database within assayed intervals. Density measurements were made on site by First Cobalt geologists. Measurements are well-distributed in the eastern half of the deposit but the deeper parts of the western portion did not have density measurements as of the effective date of the database. The rock is dense and not porous, so the immersion method was deemed appropriate and was used without sample coating. First Cobalt did not check for moisture content of the rock but did at least partially dry the samples by placing them in front of a "*space heater blowing hot air around them for a decent duration*". Because the deposit lies within a argillite-quartzite, the geologic characteristic that would most affect density is the amount of sulfide minerals present. Figure 14.7 is a scatterplot showing the relationship of analyzed total sulfur, which is a proxy for sulfide minerals, and measured density. The points clearly show a positive trend.

**Figure 14.7 Scatterplot of Analyzed S% to Measured Density**




(the blue line is a best-fit line; the red line is the conditional expectation line)

The cobalt and copper domains were used as a proxy for the amount of sulfides and therefore were used for coding intervals with density measurements. The average density values, and the values assigned to the units in the model, are summarized in Table 14.4.

**Table 14.4 Density Values Applied to the Iron Creek Block Model**

| High-grade Co and Cu | High-grade Co | High-grade Cu | Low-grade Co | Low-grade Cu | Outside | Units | Comments |
|---|---|---|---|---|---|---|---|
| 15 | 70 | 48 | 164 | 71 | 92 | number | |
| 2.97 | 2.94 | 2.85 | 2.81 | 2.81 | 2.76 | $g/cm^3$ | density |
| 10.77 | 10.88 | 11.23 | 11.39 | 11.39 | 11.59 | $ft^3/T$ | TF |
| 10.80 | 10.90 | 11.20 | 11.40 | 11.40 | 11.60 | $ft^3/T$ | TF assigned |

TF is tonnage factor

## 14.5 Sample and Composite Statistics

Once the mineral domains were defined and modeled on the 100ft-spaced cross sections, the samples were coded to the cobalt and copper domains by the polygon interpretations on those sections. Quantile plots were made of the coded assays. Capping for each domain was determined by first assessing the grade above which the outliers occur and then the outlier grades were reviewed on screen to determine materiality, grade and proximity of the closest samples, and general location. Capping levels and number of samples capped are presented in Table 14.5 and Table 14.6 for cobalt and copper, respectively. Descriptive statistics of each domain were generated and then considered when deciding capping levels. Capping values were determined for each of the cobalt and copper domains separately.

**Table 14.5 Capping Levels for Cobalt by Domain**

| Domain | Number | %Co |
|---|---|---|
| Low-grade | 14 | 0.4 |
| High-grade | None | None |
| Outside | 3 | 0.2 |

**Table 14.6 Capping Levels for Copper by Domain**

| Domain | Number | %Cu |
|---|---|---|
| Low-grade | 8 | 2.0 |
| High-grade | 8 | 8.0 |
| Outside | 380 | 0.04 |

Once the capping was completed, the drill holes were down-hole composited to 5ft intervals honoring domain boundaries. Five feet was chosen because the majority of samples are 5ft in length. Descriptive statistics of the composite database are given in Table 14.7 and Table 14.8 for cobalt and copper, respectively.

Correlograms were built from the composited cobalt grades in order to evaluate grade continuity. Correlogram parameters were used in the kriged estimate, which was used as a check on the reported

inverse distance estimate, and also to give guidance to classification of resources. The correlogram results by area and domain are summarized as follows:

Low-grade cobalt domain - The nugget is 70% of the total sill. The first sill is 95% of the total sill with a range of 30ft to 40ft depending on direction but little anisotropy. The remaining sill (5%) has a range of around 65ft m to 300ft depending on direction, with the shortest being perpendicular to bedding and no anisotropy along bedding.

High-grade cobalt domain - The nugget is 60% of the total sill. The first sill is 80% of the total sill with a range of 20ft to 40ft depending on direction. The remaining sill (20%) has a range of around 40ft to 200ft depending on direction. The longest range is along strike; the shortest is perpendicular to bedding. There is an indication of cyclicity at around 150ft.

Low-grade copper domain - The nugget is 70% of the total sill. The first sill is 90% of the total sill with a range of 5ft to 20ft depending on direction. The remaining sill (10%) has a range of around 100ft, with little anisotropy evident.

High-grade copper domain - The nugget is 50% of the total sill. The first sill is 90% of the total sill with a range of 5ft to 20ft depending on direction. The remaining sill (10%) has a range of around 50ft to 200ft depending on direction, with the longest along bedding dip.

**Table 14.7 Descriptive Composite Statistics by Cobalt Domain**

| **Low-grade cobalt domain** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **Valid** | **Median** | **Mean** | **Std Dev** | **CV** | **Min** | **Max** | **Units** |
| Length | 3670 | | | | | 0.1 | 5 | ft |
| **Co** | **3670** | **0.037** | **0.048** | **0.035** | **0.739** | **0.003** | **0.646** | **%** |
| **Capped Co** | **3670** | **0.037** | **0.047** | **0.033** | **0.696** | **0.003** | **0.400** | **%** |
| Cu | 3670 | 0.009 | 0.124 | 0.417 | 3.372 | 0.000 | 10.246 | % |
| **High-grade cobalt domain** | | | | | | | | |
| | **Valid** | **Median** | **Mean** | **Std Dev** | **CV** | **Min** | **Max** | **Units** |
| Length | 1369 | | | | | 0.1 | 5 | ft |
| Co | **1369** | **0.213** | **0.261** | **0.170** | **0.650** | **0.022** | **1.305** | **%** |
| Capped Co | **1369** | **0.213** | **0.261** | **0.170** | **0.650** | **0.022** | **1.305** | **%** |
| Cu | 1369 | 0.026 | 0.245 | 0.748 | 3.059 | 0.000 | 14.705 | % |
| **Outside cobalt domains** | | | | | | | | |
| | **Valid** | **Median** | **Mean** | **Std Dev** | **CV** | **Min** | **Max** | **Units** |
| Length | 4164 | | | | | 0.1 | 5 | ft |
| **Co** | 4164 | 0.006 | 0.008 | 0.011 | 1.392 | 0.001 | 0.355 | % |
| **Capped Co** | **4164** | **0.006** | **0.008** | **0.009** | **1.212** | **0.001** | **0.144** | **%** |
| Cu | 4164 | 0.012 | 0.138 | 0.412 | 2.994 | 0.000 | 9.286 | % |

**Table 14.8 Descriptive Composite Statistics by Copper Domain**

| Low-grade copper domain | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **Valid** | **Median** | **Mean** | **Std Dev** | **CV** | **Min** | **Max** | **Units** |
| Length | 1911 | | | | | 0.1 | 5 | ft |
| **Cu** | **1911** | **0.087** | **0.130** | **0.197** | **1.516** | **0.002** | **6.695** | **%** |
| **Capped Cu** | **1911** | **0.087** | **0.127** | **0.140** | **1.108** | **0.002** | **2.000** | **%** |
| Co | 1911 | 0.022 | 0.069 | 0.120 | 1.732 | 0.001 | 1.132 | % |
| **High-grade copper domain** | | | | | | | | |
| | **Valid** | **Median** | **Mean** | **Std Dev** | **CV** | **Min** | **Max** | **Units** |
| Length | 1182 | | | | | 0.1 | 5 | ft |
| Cu | **1182** | **0.560** | **0.868** | **1.016** | **1.171** | **0.015** | **11.447** | **%** |
| Capped Cu | **1182** | **0.560** | **0.855** | **0.932** | **1.090** | **0.015** | **7.615** | **%** |
| Co | 1182 | 0.022 | 0.074 | 0.123 | 1.658 | 0.001 | 1.415 | % |
| **Outside copper domains** | | | | | | | | |
| | **Valid** | **Median** | **Mean** | **Std Dev** | **CV** | **Min** | **Max** | **Units** |
| LNGTH | 5861 | | | | | 0.1 | 5 | ft |
| **CU** | 5861 | 0.004 | 0.014 | 0.065 | 4.725 | 0.000 | 3.357 | % |
| **CUC** | **5861** | **0.004** | **0.008** | **0.010** | **1.197** | **0.000** | **0.040** | **%** |
| CO | 5861 | 0.018 | 0.053 | 0.094 | 1.791 | 0.001 | 1.242 | % |

## 14.6 Estimation

Four types of estimates were completed: a polygonal, nearest neighbor, inverse distance, and kriged, with the inverse-distance estimate being reported. The polygonal method's results were used to check that the global resources were reasonable at a cutoff of zero. The nearest neighbor, inverse distance and kriged estimates were run several times in order to determine sensitivity to estimation parameters, and to evaluate and optimize results. The inverse distance power was three ("$ID^3$") for all domains except the low-grade copper domain where the power was two ("$ID^2$").

One estimation pass was run for each domain ranging up to 600ft along the primary axes. That first long pass did not estimate many blocks, but was used to fill in distal parts of the domain model. Only 1% of the blocks estimated for cobalt were farther than 300ft from a composite, 7% of the blocks estimated for copper were farther than 300ft from a composite. All estimates and estimation runs weighted the samples by the sample lengths. Estimation parameters are given in Table 14.9.

The estimate was complicated by sample clustering in well-mineralized cobalt material. The underground drill holes were, by necessity, collared near good cobalt mineralization and the fans drilled from underground introduced an inordinate number of well-mineralized samples. In those areas though, the copper is more weakly mineralized and so clustering is not an issue for copper.

## Table 14.9 Estimation Parameters

| Description | Parameter |
|---|---|
| **Low-grade Cobalt Domain** | |
| Samples: minimum/maximum/maximum per hole | 1 / 8 / 2 |
| Search orientations: Major, dip and rotation | 20º / -72º / 0º |
| Search distances: major/semimajor/minor (ft): first pass; second pass | 500/500/125; 200/200/50 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in %Co and distance in ft) | 0.15 / 50 (on short pass) |
| **High-grade Cobalt Domain** | |
| Samples: minimum/maximum/maximum per hole | 1 / 8 / 2 |
| Search orientations: Major, dip and rotation | 20º / -72º / 0º |
| Search distances: major/semimajor/minor (ft): first pass; second pass | 500/500/125; 200/200/50 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in %Co and distance in ft) | None |
| **Outside Modeled Cobalt Domains** | |
| Samples: minimum/maximum/maximum per hole | 2 / 12 / 3 |
| Search orientations: Major, dip and rotation | 20º / -72º / 0º |
| Search distances: major/semimajor/minor (ft) | 100 / 100 / 20 |
| Inverse distance power | 2 |
| High-grade restrictions (grade in Co% and distance in ft) | 0.02 / 10 |

| Description | Parameter |
|---|---|
| **Low-grade Copper Domain** | |
| Samples: minimum/maximum/maximum per hole | 1 / 8 / 2 |
| Search orientations: Major, dip and rotation | 20º / -72º / 0º |
| Search distances: major/semimajor/minor (ft): first pass; second pass | 600/600/150; 200/200/50 |
| Inverse distance power | 2 |
| High-grade restrictions (grade in %Cu and distance in ft) | 0.3 / 50 (on short pass) |
| **High-grade Copper Domain** | |
| Samples: minimum/maximum/maximum per hole | 1 / 10 / 2 |
| Search orientations: Major, dip and rotation | 20º / -72º / 0º |
| Search distances: major/semimajor/minor (ft): first pass; second pass | 600/600/150; 200/200/50 |
| Inverse distance power | 3 |
| High-grade restrictions (grade in %Cu and distance in ft) | None |
| **Outside Modeled Copper Domains** | |
| Samples: minimum/maximum/maximum per hole | 2 / 12 / 3 |
| Search orientations: Major, dip and rotation | 20º / -72º / 0º |
| Search distances: major/semimajor/minor (ft) | 100 / 100 / 20 |
| Inverse distance power | 2 |
| High-grade restrictions (grade in Cu% and distance in ft) | 0.02 / 10 |

## 14.7 Mineral Resources

Mr. Ristorcelli reports resources at cutoffs that are reasonable for deposits of this nature given anticipated mining and processing methods and approximate though current operating costs, while also considering economic conditions, because of the regulatory requirements that a resource exists "*in such form and quantity and of such a grade or quality that it has reasonable prospects for eventual economic extraction*." Mr. Ristorcelli classified the Iron Creek resources giving consideration to the confidence in the underlying database, sample integrity, analytical precision/reliability, QA/QC results, and confidence in geologic interpretations. While all material is classified as Inferred, the underlying database, sample integrity, analytical precision/reliability, and QA/QC results are sufficient to classify the material at a higher level of confidence. A sense of model reliability was obtained because this estimate was done in two phases – a first time and then a second time with more drill holes and then a third time with yet more drill data. Continuity defined by geology is non-existent and the changes noted during each subsequent drill campaign showed sufficient deviation to keep the classification as Inferred. Infill drilling will certainly upgrade these resources to Indicated and/or Measured. All material within either cobalt or copper domains is classified as Inferred. No material outside the domains is considered a resource nor tabulated for the potentially underground minable portion of the resources.

Technical and economic factors likely to influence the "*reasonable prospects for eventual economic extraction*" were evaluated using the best judgement of the author responsible for this section of the report. Potential for underground mining was assessed by running stope optimizations using mining costs, processing costs, and anticipated metallurgical recoveries for similar size operations in the western United States. For evaluating the open-pit potential, MDA ran a series of optimized pits using variable cobalt and copper prices, mining costs, processing costs, and anticipated metallurgical recoveries related to flotation recovery and smelting of the concentrates, and hydrometallurgical extraction for cobalt, and appropriate G&A costs for modest-sized open pit operations. The factors used in defining cutoff grades are based on US$30/lb Co and US$3/lb Cu.

The Iron Creek reported mineral resources are the fully block-diluted estimates. The blocks are 10ft long along strike, 5ft across, and 10ft high. The resources are reported at a cutoff of 0.03%CoEq for potentially open-pit minable material and 0.18%CoEq cutoff for potentially underground minable material. Cobalt equivalent was based on the simple formula of:

$$\%CoEq = \%Co + (\%Cu / 10)$$

No metallurgical recoveries were applied to either metal because it is expected that the metallurgical recoveries will be similar for both metals.

Table 14.10 presents the estimate of Inferred cobalt and copper resources at Iron Creek. The bolded line in Table 14.10 reports the current Iron Creek resources. Those resources are the cumulative total of all material both above a surface defining material most likely minable by open pit and at a cutoff of 0.03%CoEq, and material below that surface most likely minable underground and at a cutoff of 0.18%CoEq, all of which fulfill *reasonable prospects for eventual economic extraction* . Italicized lines in Table 14.10 represent material that would be available for an underground scenario. All lines in

Table 14.10 tabulate potentially minable material regardless if it is above or below the confining surface that distinguishes between open-pit or underground mining scenarios (see Figure 14.10).

**Table 14.10 Iron Creek Inferred Resources**

| Cutoff | Tons | Grade | Grade | Pounds | Grade | Pounds |
|---|---|---|---|---|---|---|
| %CoEq | | %CoEq | %Co | Cobalt | %Cu | Copper |
| 0.03 | 41,590,000 | 0.09 | 0.07 | 58,226,000 | 0.22 | 185,491,000 |
| 0.04 | 33,501,000 | 0.11 | 0.08 | 54,272,000 | 0.26 | 175,545,000 |
| 0.06 | 21,173,000 | 0.14 | 0.11 | 44,463,000 | 0.36 | 152,022,000 |
| 0.08 | 13,915,000 | 0.18 | 0.13 | 36,736,000 | 0.47 | 129,410,000 |
| **0.03/0.18*** | **29,630,000** | **0.11** | **0.08** | **45,352,000** | **0.30** | **175,448,000** |
| 0.10 | 10,232,000 | 0.21 | 0.16 | 31,924,000 | 0.54 | 111,324,000 |
| 0.12 | 8,182,000 | 0.24 | 0.18 | 28,964,000 | 0.59 | 96,384,000 |
| 0.14 | 6,789,000 | 0.26 | 0.20 | 26,613,000 | 0.62 | 84,319,000 |
| 0.15 | 6,223,000 | 0.27 | 0.21 | 25,514,000 | 0.64 | 79,157,000 |
| 0.16 | 5,723,000 | 0.28 | 0.21 | 24,266,000 | 0.66 | 74,971,000 |
| 0.18 | 4,858,000 | 0.30 | 0.23 | 22,250,000 | 0.69 | 66,749,000 |
| *0.20* | *4,100,000* | *0.32* | *0.25* | *20,172,000* | *0.71* | *58,384,000* |
| 0.25 | 2,610,000 | 0.37 | 0.29 | 15,242,000 | 0.79 | 41,395,000 |
| 0.30 | 1,707,000 | 0.42 | 0.34 | 11,642,000 | 0.83 | 28,370,000 |
| 0.35 | 1,144,000 | 0.47 | 0.39 | 8,923,000 | 0.84 | 19,219,000 |
| 0.40 | 756,000 | 0.53 | 0.44 | 6,623,000 | 0.87 | 13,124,000 |

*Note: * All classified resource blocks located a) between the topographic surface and the surface defining material most likely minable by open pit and with grades greater than 0.03% CoEq were included in the reported mineral resources and b) resource blocks located below the surface defining material most likely minable by open pit and with grades greater than 0.18% CoEq were included in the reported underground mineral resources.".*

Representative cross sections for the cobalt and copper block models are shown in Figure 14.8 and Figure 14.8, respectively. A little over half of the resources lie within the No Name zone; the remainder is in the Waite zone footwall to the No Name zone.

**Figure 14.8 Iron Creek Cobalt Domains, Geology and Block Model– Section 2600**

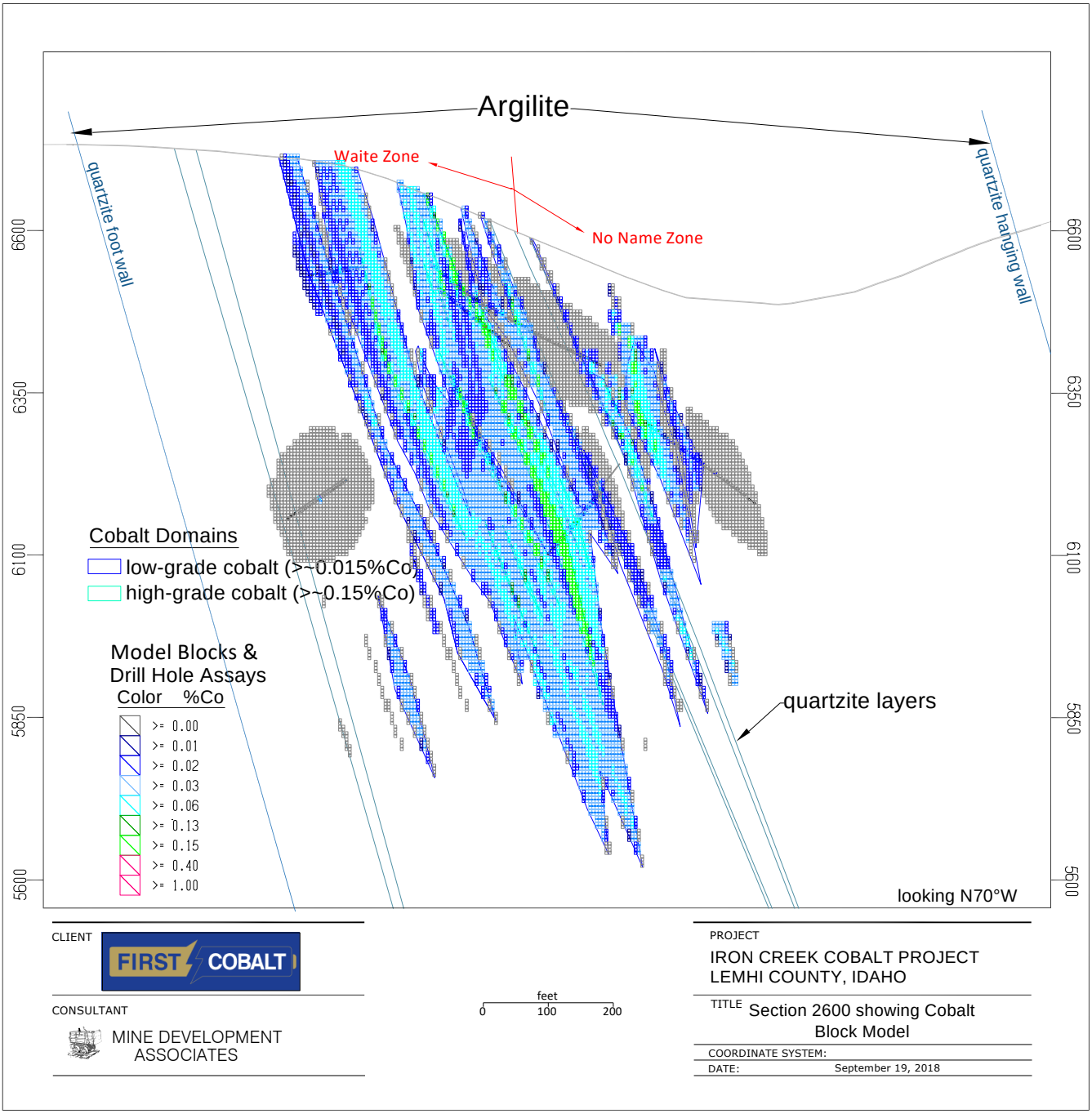
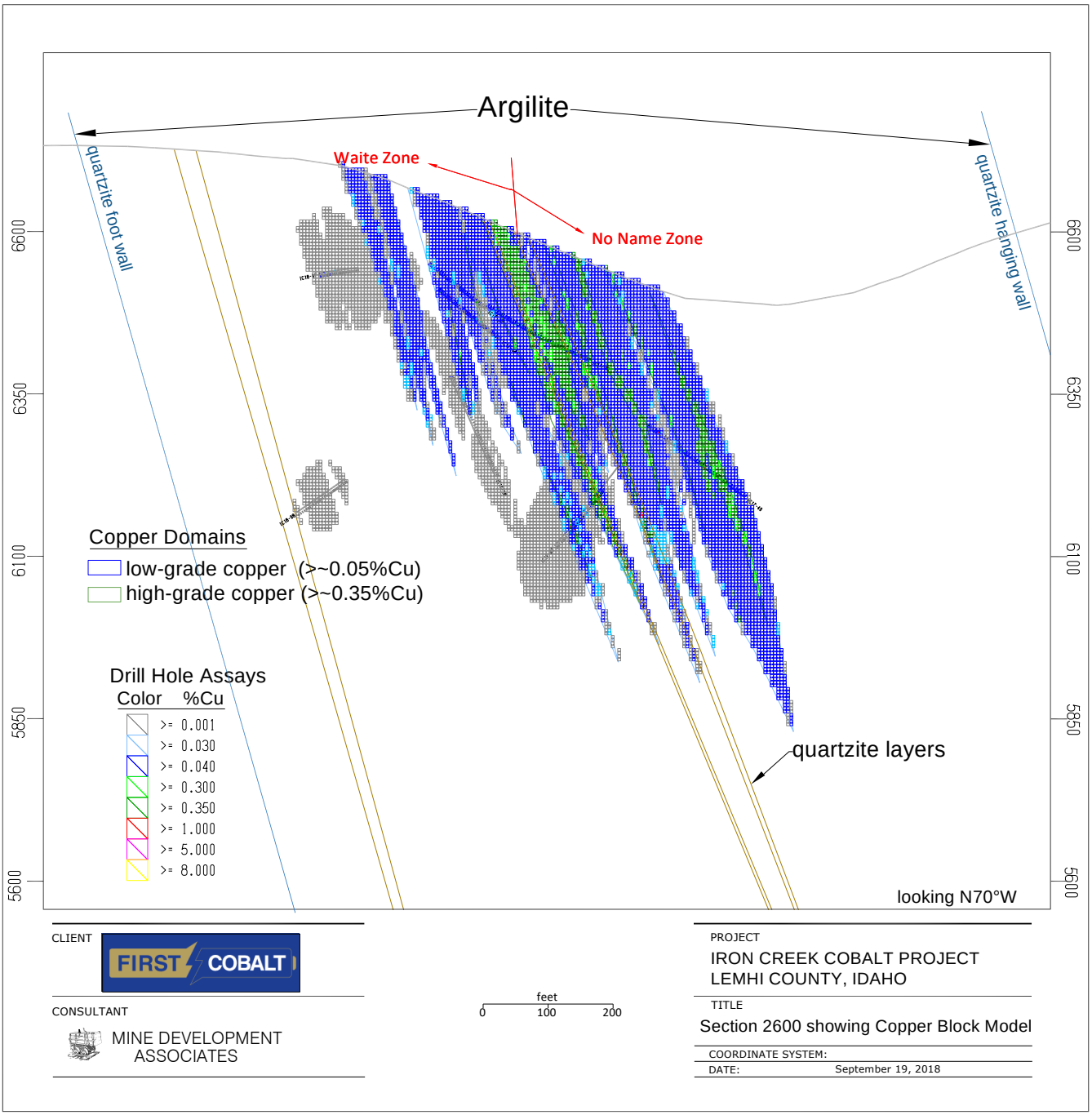


**Figure 14.9 Iron Creek Copper Domains, Geology and Block Model– Section 2600**



## 14.8 Discussion of Resources

First Cobalt has shown that important cobalt and copper resources exist at Iron Creek. While the resources are classified only as Inferred, more drilling internally will upgrade those resources. Importantly, the deposit is open along strike in both directions so this estimate is only a snap-shot in time with expectations that it will increase in size. Tertiary volcanic rock covers surface expressions of extensions in one direction and there is mineralized outcrop a mile to the east.

Insight into the reliability of the domain model and the predictability of the deposit were gained from the three iterations of modeling performed with successively increased amounts of drill data. In general, the strike and dip of the deposit(s) are consistent, the thicker mineralized zones are relatively predictable, but the smaller lenses are difficult to predict reliably. It is this yet-to-be proven continuity that requires the Inferred classification in this report. However, the thicker mineralized zones, which reach up to 70ft for cobalt zones and over 100ft for copper zones, are more continuous. Infill drilling will certainly upgrade these resources to Indicated and/or Measured.

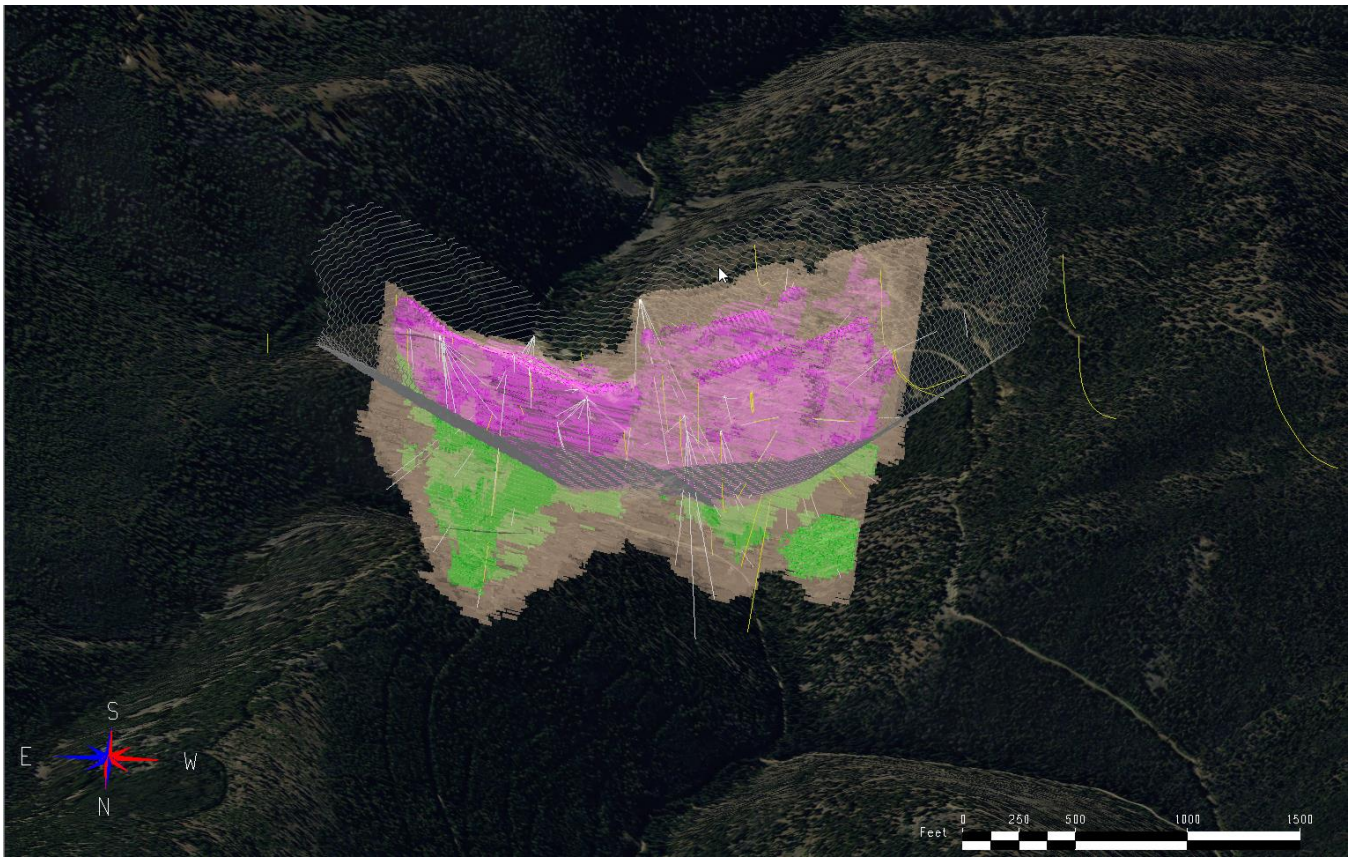
The First Cobalt drilling has extended the cobalt and copper mineralization for 2,300ft along strike and 1,800ft vertically. MDA considers the deposit to be open along strike and at depth, and therefore the resources reported herein to have good potential to increase.

Regulatory guidelines require that resources meet "*reasonable prospects for eventual economic extraction*", so it is often the case that total mineralization is not presented. Figure 14.10 shows the resource-confining pit and grade shells at variable cutoffs, as well as the extensions of mineralization not reported.

As the project is too early stage to make any definitive decision on underground or open-pit exploitation, this estimate allows for assessing resources if only an underground scenario is to be considered. The reporting cutoff considered for underground exploitation resources would be 0.18%CoEq. Figure 14.11 shows the grade shells at cutoffs of 0.2%CoEq and 0.35%CoEq, which equate to two of the italicized lines in Table 14.10. These sub-sets of the resources for potential underground exploitation include 4.1 million tons grading 0.32%CoEq at a cutoff of 0.2%CoEq, with a subset of 1.144 million tons grading 0.47%CoEq at a cutoff of 0.35%CoEq. The tabulations at 0.18%CoEq, 0.20%CoEq and 0.35%CoEq represents material that would be available for an underground scenario.

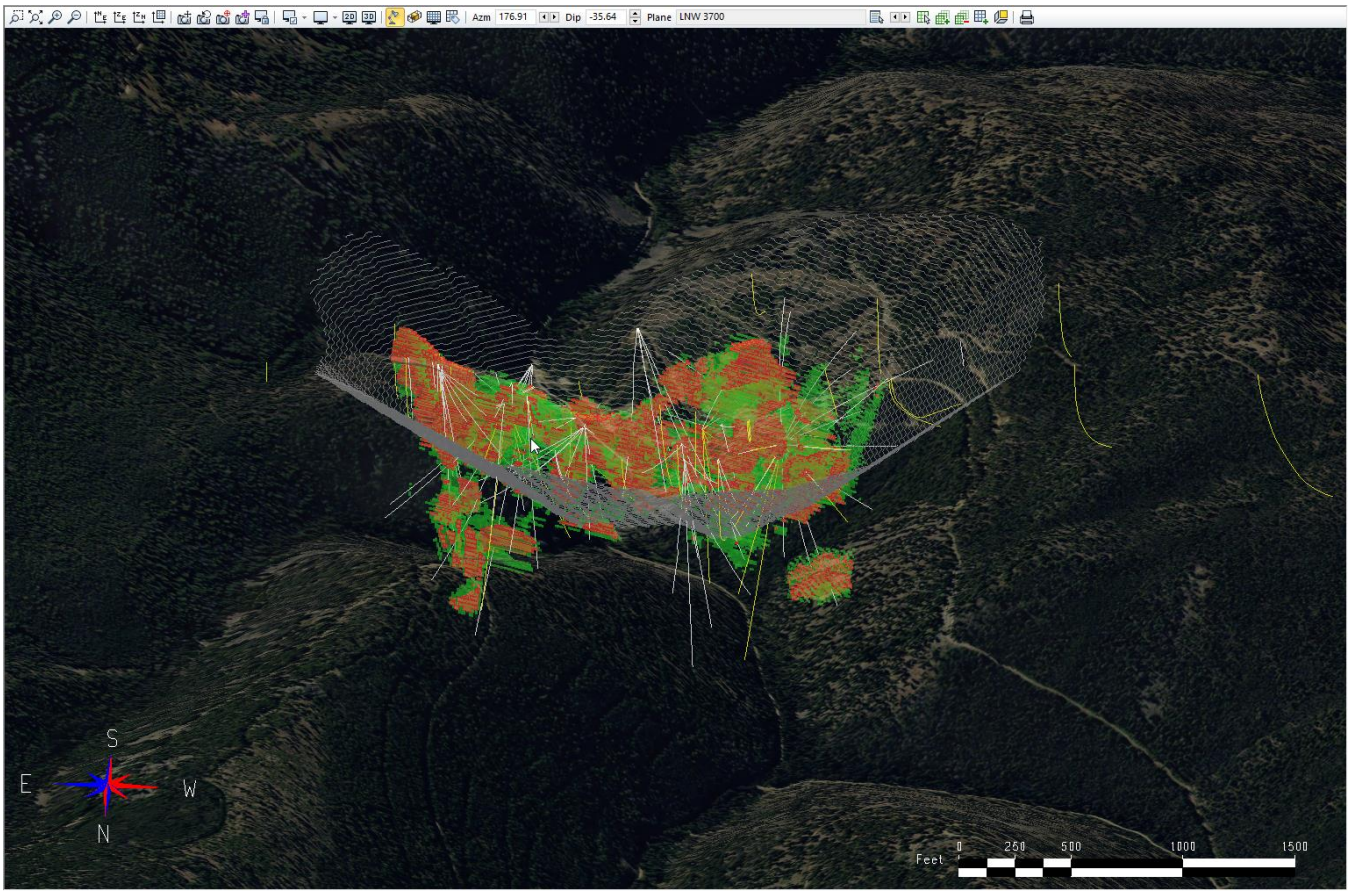
The government topographic base has been shown to be locally not accurate based on drill-hole collar surveying. It is sufficient for the level of study reported herein and does not impact the estimate in any material way, but it should be and is in the process of being updated.

**Figure 14.10 Confining Surfaces and Volumes and Additional Mineralization**




*Note: looking south; white lines are First Cobalt's drill holes (not all have assayed values as of this report date); yellow lines are historical drill holes; gray lines show the resource-confining pit outline; green shows 0.15%CoEq grade shells, which represent the reported resources below the resource-confining pit; magenta shows 0.15%CoEq shells above the resource-confining pit; and tan shows the entire 0.03%CoEq grade shell, of which only the portion above the resource-confining pit is reported in Table 14.10.*

**Figure 14.11 Grade Shells at 0.20%CoEq and 0.35%CoEq**




*Note: looking south; white lines are First Cobalt's drill holes (not all have assayed values as of this report date); yellow lines are historic drill holes; gray lines are the resource confining pit shell; green solids are 0.20%CoEq shells, which are reported in the resource table; and red shells are 0.35%CoEq shells, which are reported in the resource table.*

## 15.0 MINERAL RESERVE ESTIMATES (ITEM 15)

There are no estimated mineral reserves for the Iron Creek project as of the date of this report.

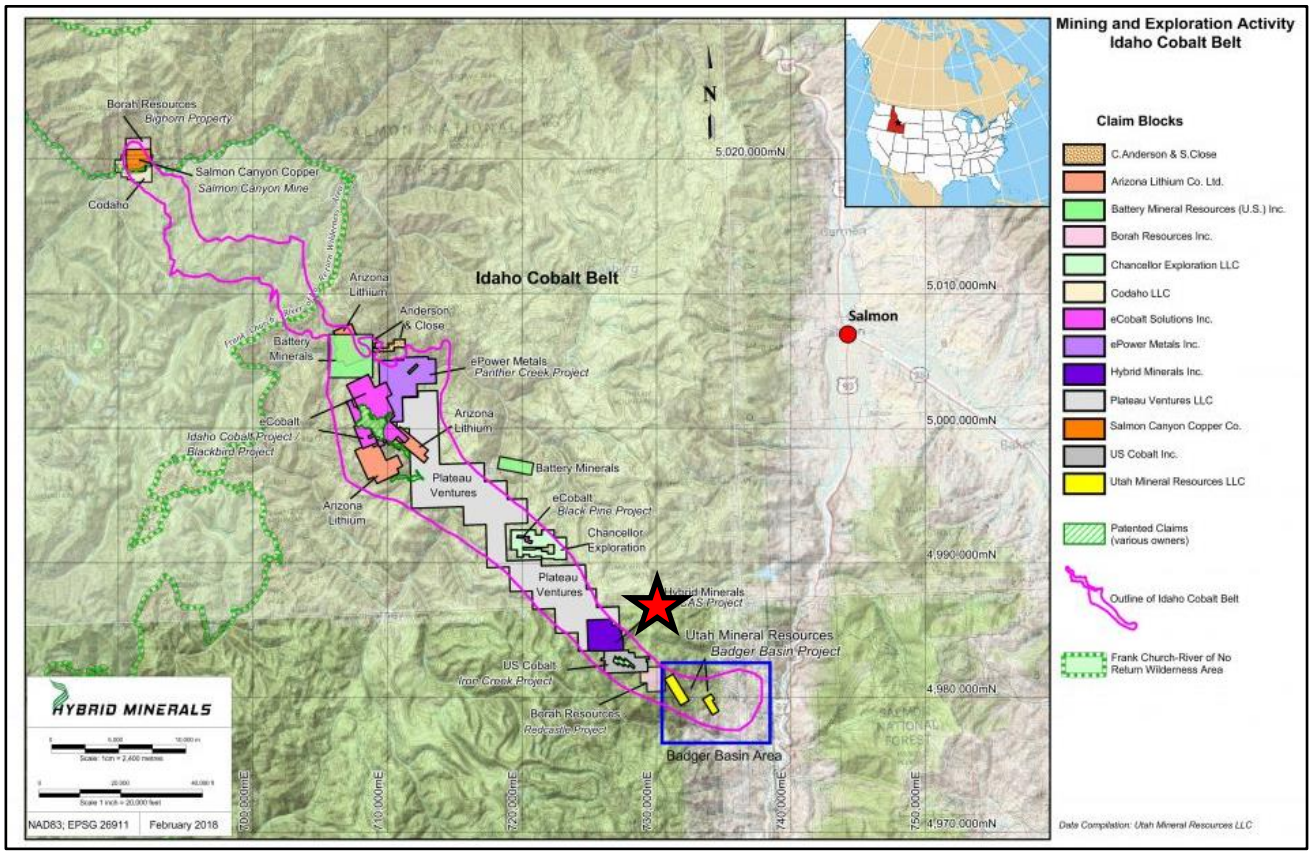
Item 16 through Item 22 are not applicable to this report and are omitted.

## 23.0 ADJACENT PROPERTIES (ITEM 23)

The following information is derived from company websites regarding location and activities that have not been validated by title searches. These activities have been disclosed publicly through press releases. The authors of this report have not verified the information and the information is not necessarily indicative of the mineralization on the Iron Creek property that is the subject of this technical report.

Over the past two years, several junior exploration companies have become active within the Idaho Cobalt Belt (Figure 23.1). For the most part, activity has been restricted to surface sampling of existing surface exposures at cobalt-bearing mineral occurrences. High grades of cobalt are reported, but most samples are grabs from mine dumps or talus debris, and therefore are not representative. Geophysical surveys have been reported by Hybrid Minerals and International Cobalt. Hybrid Minerals is exploring the "Cas Property" immediately north of the Iron Creek property. In 2014, ground self-potential gradient surveys were completed over an area including known cobalt-copper prospects. Anomalies indicative of potential for mineralization were identified, but there has been no drilling. International Cobalt completed an airborne electro-magnetic survey in 2017 over their Blackbird Creek property south the historic Blackbird project site. No drilling has been done as follow up despite identified EM and magnetic anomalies considered to be associated with cobalt-copper mineralization.

**Figure 23.1 Exploration Activity in the Idaho Cobalt Belt**



The most advanced property with respect to development is the Idaho Cobalt Project held by eCobalt Solutions (Figure 23.1). Two resources have been drilled and estimated: Ram and Sunrise. Ram has been targeted for production in 2020. The resource estimate for Ram is given below in Table 23.1.

**Table 23.1 eCobalt Solutions Reported Resources**
(from Foo et al., 2017)

| eCobalt 2018 Resource Model (0.20% cut-off grade) | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Category** | **M Tons** | **Co%** | **Co (M lbs)** | **Cu%** | **Cu (M lbs)** | **oz Au/t** | **Au (oz)** |
| Measured | 1.50 | 0.66 | 19.9 | 0.78 | 23.6 | 0.017 | 26,000 |
| Indicated | 2.37 | 0.54 | 25.8 | 0.89 | 42.2 | 0.018 | 42,000 |
| M + I | 3.87 | 0.59 | 45.7 | 0.85 | 65.8 | 0.017 | 68,000 |
| Inferred | 1.82 | 0.46 | 16.7 | 0.81 | 29.4 | 0.015 | 27,000 |

For perspective of deposit size in the Idaho Cobalt Belt, the Blackbird district has combined historical production plus current reserves that total 17,000,000t at 0.7% Co, 1.4% Cu, and 1g Au/t (Hitzman, et. al., 2017). Individual deposits are open at depth.

## 24.0 OTHER RELEVANT DATA AND INFORMATION (ITEM 24)

MDA is not aware of any other data or information relevant to the mineral resource estimate described in this report.

## 25.0 INTERPRETATION AND CONCLUSIONS (ITEM 25)

Mr. Ristorcelli and Mr. Schlitt have reviewed the Iron Creek project data and Mr. Ristorcelli has visited the project site. The authors believe that the data provided by First Cobalt are generally an accurate and reasonable representation of the Iron Creek project. As well, the exploration conducted by First Cobalt has produced information on which important interpretations, conclusions and decisions can be made. All historical information, on the other hand, cannot be used in this report for anything more than an indication of mineralization.

Fully block-diluted Inferred resources of 29.6 million tons at average cobalt and copper grades of 0.08% and 0.3%, respectively, are the current Iron Creek resources reported at a cutoff of 0.03%CoEq (%CoEq = %Co + (%Cu / 10) for potentially open-pit minable material and 0.18%CoEq cutoff for potentially underground minable material. Confidence in the resources reported in this Technical Report is higher than what is portrayed by the Inferred classification. The principal factor that keeps the resources from being classified higher is the inability to confidently correlate mineralized zones from one drill hole to another with the present drill spacing. Certainly, the thicker zones can be correlated presently with moderate confidence, but because there is nothing unique yet known about any of the zones to definitively make correlations, and until there is something unique defined to make the correlations, infill drilling will be required for upgrading the resources. The thicker mineralized zones, which reach up to 70ft for cobalt zones and over 100ft for copper zones are more continuous and will most likely require less infill drilling.

The cobalt occurs largely or entirely within pyrite, there is a distinct lack of cobaltite, and the cobalt and copper mineralization are not necessarily spatially coincident. Both metals are seemingly independent and occupy separate mineralized domains that are in part overlapping. Cobalt and copper commonly occur in economic grades separate from each other.

Cobalt zones up to 70ft thick and copper zones up to 100ft thick have been encountered in the drilling. That drilling has extended the cobalt and copper mineralization for 2,300ft along strike and 1,800ft vertically. MDA considers the deposit to be open along strike and at depth, except for copper in the eastern half of the deposit which seems to be closed off at depth. The Iron Creek project is a project in early stages of development and exploration. The resource estimate presented in this report should be considered only a snap shot in time of what ultimately should become larger resources.

MDA believes the Iron Creek project is too early stage to make any definitive decision on underground versus open-pit exploitation, but the reported resources are dominated by those that could be exploited by open-pit methods. Nevertheless, multiple cutoff grades are presented in Table 14.10 so the reader can get a sense of material that would be available for potentially exploiting as underground resources.

## 26.0 RECOMMENDATIONS (ITEM 26)

Iron Creek is a property of merit deserving substantial additional exploration and development. Most importantly, the property deserves substantial additional drilling, not only along strike and at depth, but also infill drilling. Infill drill spacing requirements will be highly variable depending on whether the drilling is in the thick 50ft- to 100ft-thick zones or the thinner zones. Exploration drilling outside the main resource area is also justified.

Costs and an outline of Phase I of the recommended program are given in Table 26.1. The program includes a total of around 70,000ft of drilling, of which approximately 35,000ft are for infill drilling, 28,000ft for expansion drilling, and 7,000ft for exploration drilling. Some of the drilling will be done from underground in Adit 3 so the cost estimate includes rehabilitation and preparatory work in the adit. The cost of the underground rehabilitation is budgeted at what seems high at $1.1million because there are so many unknowns. The total drill budget comes to $7 million when assaying and sampling, geology, managing, road/pad construction, and maintenance of the underground workings are included.

**Table 26.1 Cost Estimate for the Recommended Program**

| Item | | Estimated Cost |
|---|---|---|
| Adit rehabilitation | | $ 1,100,000 |
| Direct drilling* | $ 3,500,000 | |
| Assaying and Sampling | $ 900,000 | |
| Roads, pads and underground maintenance | $ 1,200,000 | |
| Geology (drilling related and some surface) | $ 1,400,000 | |
| Drilling sub-total | | $ 7,000,000 |
| Resource estimate and preliminary economics | | $ 150,000 |
| Metallurgy | | $ 150,000 |
| Geophysics | | $ 100,000 |
| Permitting and Legal | | $ 50,000 |
| Reporting | | $ 50,000 |
| *Contingency of 10% (rounded)* | | *$ 900,000* |
| ***Total*** | | ***$ 9,500,000*** |
| *Infill, expansion, and exploration | | |

Metallurgical test work should continue and those results should be incorporated in updated resource estimates and preliminary economic evaluations. Electrical geophysical programs are recommended to explore for and locate continuations of the defined zones of mineralization as well as locate others. As with all projects, ongoing permitting and legal work as well as reporting is necessary. A 10% contingency is included to cover the unexpected. If Phase I were to be successful, a Phase II budget would be similar to but potentially substantially larger Phase I, and it would emphasize more engineering.

The authors believe that the Iron Creek project is a project of merit and warrants the proposed program and level of expenditures outlined above.

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## 28.0 DATE AND SIGNATURE PAGE (ITEM 28)

Effective Date of report: September 18, 2018
The data on which the contained resource estimates are based was current as of the Effective Date.

Completion Date of report: October 15, 2018

***"Mr. Steven J. Ristorcelli"*** Date Signed:
Steven Ristorcelli, C. P. G. October 15, 2018

***"Mr. Joseph Schlitt"*** Date Signed:
Joseph Schlitt, MMSA-QP October 15, 2018

## 29.0 CERTIFICATE OF QUALIFIED PERSONS (ITEM 29)

### STEVEN RISTORCELLI, C. P. G.

I, Steven Ristorcelli, C. P. G., do hereby certify that I am currently employed as Principal Geologist by: Mine Development Associates, Inc., 210 South Rock Blvd., Reno, Nevada 89502.

1. I am co-author of the report entitled "*Technical Report and Mineral Resources, Iron Creek Cobalt Project, Lemhi County, Idaho, USA*" prepared for First Cobalt Corp. with an effective date of September 18, 2018 and dated October 15, 2018. I am the principal author for all sections of this report except Section 13.0 of this Technical Report. I have reviewed and participated in the editing of the remaining sections of the report, and I concur with their contents. I have relied on other experts as described in Section 3.

2. I graduated with a Bachelor of Science degree in Geology from Colorado State University in 1977 and a Master of Science degree in Geology from the University of New Mexico in 1980. I am a Registered Professional Geologist in the state of California (#3964) and a Certified Professional Geologist (#10257) with the American Institute of Professional Geologists.

3. I have worked as a geologist continuously for 40 years since graduation from undergraduate university. During that time, I have been engaged in the exploration, definition, and modeling of multiple base-metal deposits in North America and South America, and have estimated the mineral resources for those deposits.

4. I have read the definition of "qualified person" set out in National Instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

5. I had prior involvement with the property in the mid-1980s having worked on Iron Creek for the company that was the owner at the time. I had no direct ownership then, nor do I have any now. I visited the project and worked with company files and reviewed core on the 18th of June through the 19th of June, 2018.

6. I am independent of First Cobalt Corp. and all their subsidiaries as defined in Section 1.5 of NI 43-101 and in Section 1.5 of the Companion Policy to NI 43-101.

7. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

8. As of the effective date of this report, to the best of my knowledge, information and belief, this Technical Report contains all the scientific and technical information that is required to be disclosed to make this Technical Report not misleading.

Dated this 15th day of October, 2018
"*S. Ristorcelli*"
Signature of Qualified Person
Steven Ristorcelli, C. P. G.

**Hydrometal, Inc.**

**CERTIFICATE OF QUALIFIED PERSON – William Joseph Schlitt**

I, W. Joseph Schlitt, do hereby certify that I am currently employed as president by:

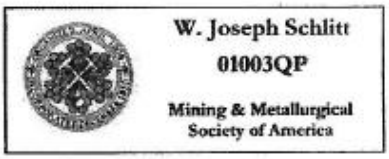
Hydrometal, Inc., P.O. Box 309, Knightsen, California 94548, U.S.A.

1. I am a co-author of the report entitled "*Technical Report and Mineral Resources, Iron Creek Cobalt Project, Lemhi County, Idaho, USA*" prepared for First Cobalt Corp. with an Effective Date of September 18, 2018 and dated October 15, 2018. I am the principal author of Sections 1.4 and 13.0 of this technical report. I have not relied on other experts in preparing these sections.
2. I graduated with a Bachelor of Science degree in Metallurgical Engineering (with highest honors) from Carnegie Institute of Technology, Pittsburgh, Pennsylvania in 1964 and with a Doctor of Philosophy in Metallurgy (with honors) from The Pennsylvania State University, University Park, Pennsylvania in 1968. I am a Qualified Professional member of the Mining and Metallurgical Society of America No. 01003QP and a Registered Professional Metallurgical Engineer (Texas No. 53603).
3. I have worked as a Metallurgist for 50 years since my graduation from university. During this time I have developed and managed numerous testwork programs involving the beneficiation of both base and precious metal ores and the extraction and refining of the contained metal values.
4. I have read the definition of "qualified person" set out in National Instrument 43-101(NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I have had no prior involvement with the property and have not yet visited the site. However, I have made visits to the laboratory facility where the current testwork is being conducted.
6. I am independent of First Cobalt Corp. and all its subsidiaries as defined in Section 1.5 of NI 43-101 and in Section 1.5 of the Companion Policy to NI 43-101.
7. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.
8. As of the Effective date of this report, to the best of my knowledge, information and belief, this Technical Report contains all the scientific and technical information that is required to be disclosed to make this Technical Report not misleading.

Dated this 15th Day of October 2018

/s/ W. Joseph Schlitt
(signed and sealed)

W. Joseph Schlitt, President
Hydrometal, Inc.



# APPENDIX A

## List of Iron Creek Unpatented Claims

Located within Township 19 North, Range 20 East, B.M.,
Blackbird Mining District, Lemhi County, Idaho.

| Claim Name | BLM Serial Number |
|---|---|
| BR 1 | IMC 215857 |
| BR 2 | IMC 215858 |
| BR 3 | IMC 215859 |
| BR 4 | IMC 215860 |
| BR 5 | IMC 215861 |
| BR 6 | IMC 215862 |
| BR 7 | IMC 215863 |
| BR 8 | IMC 215864 |
| BR 9 | IMC 215865 |
| BR 10 | IMC 215866 |
| BR 11 | IMC 215867 |
| BR 12 | IMC 215868 |
| BR 13 | IMC 215869 |
| BR 14 | IMC 215870 |
| BR 15 | IMC 215871 |
| BR 16 | IMC 215872 |
| BR 17 | IMC 215873 |
| BR 18 | IMC 215874 |
| BR 19 | IMC 215875 |
| BR 20 | IMC 215876 |
| BR 21 | IMC 215877 |
| BR 22 | IMC 215878 |
| BR 23 | IMC 215879 |
| BR 24 | IMC 215880 |
| BR 25 | IMC 215881 |
| BR 26 | IMC 215882 |
| BR 27 | IMC 215883 |
| BR 28 | IMC 215884 |
| BR 29 | IMC 215885 |
| BR 30 | IMC 215886 |
| BR 31 | IMC 215887 |
| BR 32 | IMC 215888 |
| BR 33 | IMC 215889 |
| BR 34 | IMC 215890 |
| BR 35 | IMC 215891 |
| BR 36 | IMC 215892 |
| BR 37 | IMC 215893 |
| BR 38 | IMC 215894 |
| BR 39 | IMC 215895 |
| BR 40 | IMC 215896 |
| BR 41 | IMC 215897 |
| BR 42 | IMC 215898 |

| Claim Name | BLM Serial Number |
|---|---|
| BR 43 | IMC 215899 |
| BR 44 | IMC 215900 |
| BR 45 | IMC 215901 |
| BR 46 | IMC 215902 |
| BR 47 | IMC 215903 |
| BR 48 | IMC 215904 |
| BR 49 | IMC 215905 |
| BR 50 | IMC 215906 |
| BR 51 | IMC 215907 |
| BR 52 | IMC 215908 |
| BR 53 | IMC 215909 |
| BR 54 | IMC 215910 |
| BR 55 | IMC 215911 |
| BR 56 | IMC 215912 |
| BR 57 | IMC 215913 |
| BR 58 | IMC 215856 |
| NBR 1 | IMC 216158 |
| NBR 2 | IMC 216159 |
| NBR 3 | IMC 216160 |
| NBR 4 | IMC 216161 |
| NBR 5 | IMC 216162 |
| NBR 6 | IMC 216163 |
| NBR 7 | IMC 216164 |
| NBR 8 | IMC 216165 |
| NBR 9 | IMC 216166 |
| NBR 10 | IMC 216167 |
| NBR 11 | IMC 216168 |
| NBR 12 | IMC 216169 |
| NBR 13 | IMC 216170 |
| NBR 14 | IMC 216171 |
| NBR 15 | IMC 216172 |
| NBR 16 | IMC 216173 |
| NBR 17 | IMC 216174 |
| NBR 18 | IMC 216175 |
| NBR 19 | IMC 216176 |
| NBR 20 | IMC 216177 |
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| NBR 22 | IMC 216179 |
| NBR 23 | IMC 216180 |
| NBR 24 | IMC 216181 |
| NBR 25 | IMC 216182 |